ELECTRICAL REVIEW

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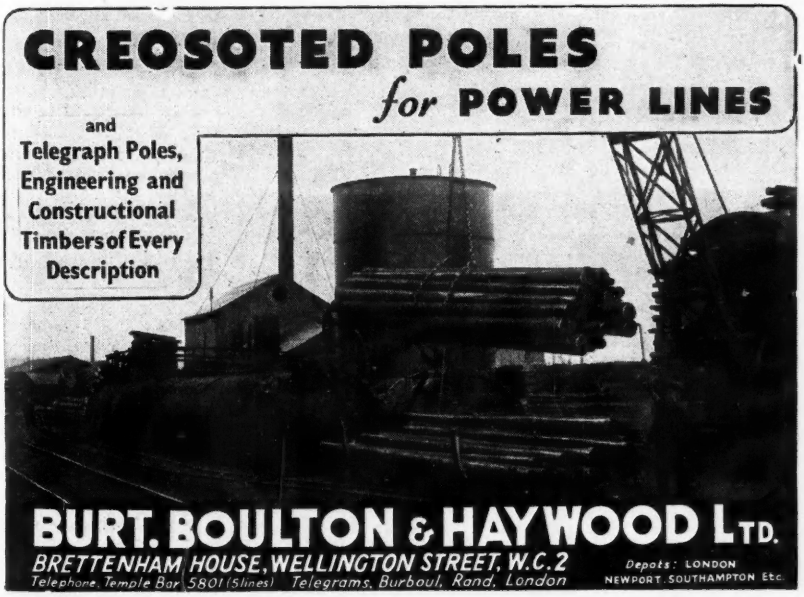
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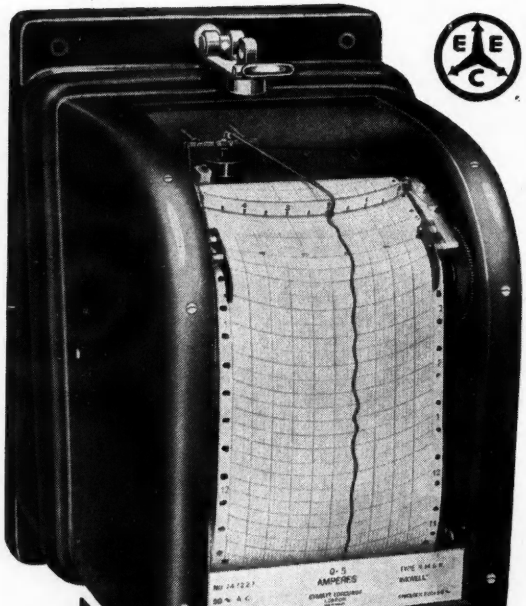

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ELECTRICAL REVIEW

THE OLDEST ELECTRICAL PAPER

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27th MAY, 1949

Electric Vehicle Progress

POSSIBILITIES OF EXPANSION

ALTHOUGH at last week's Electric Vehicle Association luncheon much was made of the increase in the number of battery electric vehicles in use during the past ten years this increase seems to have been incommensurate with the potentialities. Within its admitted limits, the electric vehicle is superior to all other forms of carrier. No other vehicle is so smooth in running, so clean or so able to withstand for years the strain of frequent starts and stops. And yet many tradesmen and most of the public are still prone to look on it as something out of the ordinary instead of an everyday affair.

Capital and Running Costs

What are the principal reasons for this? First, we suppose, is the heavier initial cost by comparison with horse-drawn or petrol-motor vehicles. This is a consideration, especially to the smaller tradesman, but the comparison is incomplete without proper regard for the longer life and much lower running expenses of the electric vehicle. Nevertheless the manufacturers must examine all possibilities of reducing the selling price to add to the "electric's" undoubted attractions. It is possible that some measure of standardization may help—it would at least be of convenience to the users of vehicles of more than one make. Increased production would do even more to reduce unit costs but here the manufacturers come up against the usual difficulty of having to be sure of a market before they can produce more.

What else would help to popularize the electric vehicle? Naturally a reduction in the already low running costs and it is in this respect that British Electricity could do a great deal and in doing it actually improve its own position.

Battery charging is naturally a night load which means that it is almost entirely off the peak. But there is virtue in that "almost." Mr. Peter Rochs, chairman of the Electric Vehicle Association, pointed out at the luncheon that, normally, charging is likely to take about twelve hours and should start at 5.30 or 6 p.m. That is satisfactory to the electricity suppliers in summer; in winter the charging load is apt to come on at a peak period. Therefore unless operators are available to put the batteries on charge at a later hour the owners have to begin charging at a high "unit" rate, relying on a time switch to change over when the off-peak rate commences.

How the B.E.A. Could Help

This assumes that there *is* an off-peak rate but the practice of the Electricity Boards in this respect and as regards charges in general is most varied. Mr. Rochs mentioned an instance of 23 different rates for the 26 depots of one concern. No doubt Lord Citrine and the Electricity Board chairmen present made a mental resolve to look into these matters. They could do much to encourage development by the introduction of favourable terms. Also, by employing "electrics" themselves they would help considerably and set an

example to be followed by other national bodies. One of these, British Railways, still has 7,000 horses at work and only about 30 electric vehicles, according to Sir Cyril Hurcomb, chairman of the British Transport Commission. It is experimenting with electrical "mechanical horses," it is true, but types of electric van already available should be suitable for railway delivery and collection work. Finally there is the General Post Office whose needs could be admirably served by electric vehicles.

STREET TRACTION

At the same luncheon Sir Cyril Hurcomb referred to the tendency on the part of the London Transport Executive to abandon electric (surface) traction in favour of oil - engined buses as "disappointing . . . from the point of view of those who would like to retain the load for electricity." In our view disappointment extends much further than this. British electrical manufacturers have built up a reputation for tramway and trolley-bus equipment, which causes overseas transport authorities to look to this country for guidance. There is likely to be an adverse effect upon export trade if it is thought that British practice does not square with British precept.

GENERATION IN APRIL

The fact that Easter occurred in different months this year and last upsets the basis of comparison in the latest generation figures issued by the Ministry of Fuel and Power. The rate of increase in April fell to 0.8 per cent compared with 17.6 per cent in March, reflecting the loss of the industrial load during the holidays. For the four months to the end of April the average increase in electricity generated was 5.8 per cent ; this compares with a gain of 9.1 per cent for the whole of 1948. An interesting point to be discerned in the April figures is that, although output was 0.8 per cent higher, there was a decrease of 0.3 per cent in coal consumed.

GLEAM OF HOPE

The continued deferment of the date at which available plant capacity will balance demand at all times has made many an electrical heart sick. It was, therefore, with some revival of hope that those present at the laying of the foundation stone of the Poole power station heard Sir Henry Self say that the B.E.A. expected to commission this year new plant with more than the capacity represented by the year's increase in demand. This means an addition of 1,000 MW and Sir Henry said that a similar amount would be commissioned next year and thereafter the increase would be between 1,500 and 2,500 MW "if national circumstances permit." Recalling past experience, some may not be so confident of fulfilment of the programme, but no doubt improvement will result from the tighter grasp on "progressing" which the B.E.A. now has.

NILE WATER POWER

The execution of the Owen Falls hydro-electric scheme planned by the Government of Uganda, depended upon the approval of the Egyptian Government under the Nile Waters Agreement of 1929 by which this country undertook to consult the Egyptions before carrying out any scheme likely to interfere with the flow of the Nile, which is Egypt's life-blood. Mr. Bevin was able to announce in the House of Commons last week that agreement had been reached in connection with the Owen Falls project and contracts are now to be prepared by the Uganda Electricity Board for approval by the British and Egyptian Governments. The chairman of the Board is Mr. C. R. Westlake, formerly borough electrical engineer of Finchley, and the London member is Sir John Kennedy, who was chairman of the Electricity Commission.

E.T.U. WAGE POLICY

Among the many subjects discussed at this week's policy conference of the Electrical Trades Union the one of most significance was the Union's view on the Government's desire to prevent wages and profits rising above what is considered to be an economic level. It is clear that the Union does not accept the decision of the Trades Union Congress to back the Government and is continuing its activities to secure better wages and conditions for its members in all branches of industry. This, in turn, will lead employers to reconsider their dividend limitation policy and help to re-start the inflationary trend.

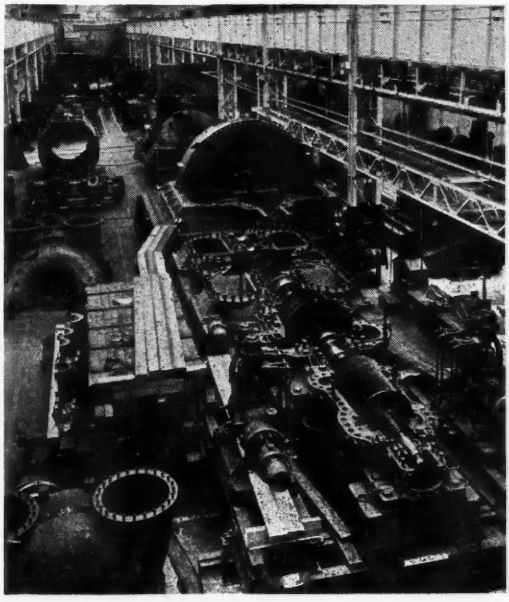
Power Plant

MANUFACTURING ACTIVITIES AT HARTLEPOOL

NOT many engineering concerns are able to offer so wide a range of power plant, oil and steam both for marine and land uses, as the group of associated companies of which Sir Summers Hunter is chairman, including Richardsons, Westgarth & Co., Ltd.

Apart from equipping and repairing ships, one of this group's wartime achievements was the construction of five mobile power stations, each of 2,500 kW. Transportable boilers and turbo-alternators have been made by several firms, but it is claimed that the Westgarth works was the only one to undertake both boilers and turbines and to manufacture the complete equipment.

In the same way this company is the only one of the half-dozen producing power station plant in this country which manufactures the complete equipment from the water-tube boilers to the alternators in its own works, at Hartlepool, which have been reorganized and lately enlarged by the addition of new generator winding shops. Turbine construction has been going on there for forty years, though the building of small alternators did not commence until twenty years later. Orders for 30 MW sets were accepted in 1939, two being built before the commencement of the post-war generating station programme.



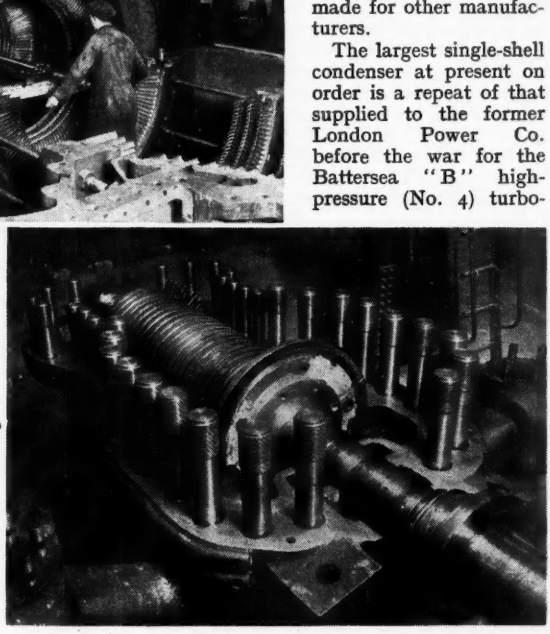
General view of turbine shop at the Hartlepool Works

Present orders represent seven times the work that was in hand four years ago and those booked for the B.E.A. total 500 MW. In addition to standard 30 MW sets, one of which is due for commissioning later this year, three 52.5 MW sets for the Southwick "B" station at Brighton are now under construction. They are of the same general type as the smaller sets, but designed to take steam at 900 lb/sq in and 900 deg F with sufficient exhaust area to utilize efficiently a vacuum of 29in at their maximum rating. The tip speed of the last row of low-pressure blading will be not less than 1,250 ft/sec, or more than 850 miles/hour. The fabricated alternators are of 11 kV at 3,000 r.p.m. and the twin-shell 50,000 sq ft condensers will be transported in three pieces.

The half-finished 60 MW turbine for the Portobello station at Edinburgh is designed for steam at 1,350 lb/sq in and 950 deg F with a vacuum of 29.1in. It has to fit into the space formerly occupied by a single 12,500 kV set, so has been designed as a three-cylinder cross-compound unit to drive two identical 30 MW alternators of 13,200 V at 3,000 r.p.m. Both stator housings have been

fabricated, one rotor has been wound and the other is being wound.

The very large volume of exhaust steam led to the adoption of four parallel blade paths for the final expansions, and in order to preserve a compact arrangement they are incorporated in a single low-pressure cylinder discharging into a single shell condenser. The large rotor has been built up and annealed to stress-relieve the fifteen welds, with counter-weighted supports to prevent sagging while rotating during the heating-up and cooling periods, each of which took 2½ days. Large air ejectors are also being made for Portobello, and de-aerators of 1,250 sq ft for 600,000 lb/hr.



Above: Grinding blade-ends of quadruple flow low-pressure cylinder of cross-compound turbine for Portobello. Right: High-pressure portion of 60 MW twin alternator set for Portobello

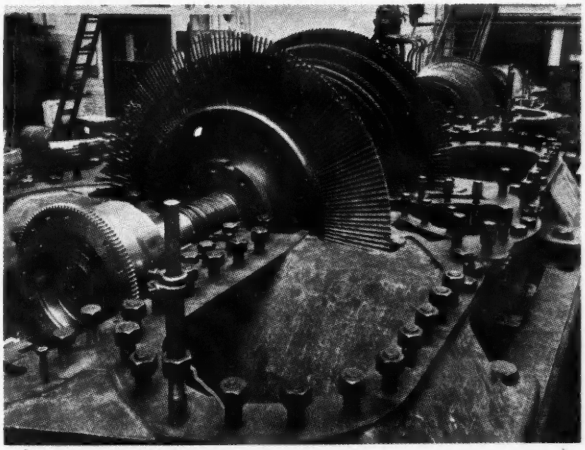
The three-cylinder turbines for Rye House (Nos. 1 and 2) are each of 32 MW for 600 lb/sq in at 850 deg F and 3,000 r.p.m., with twin shell condensers of 40,000 sq ft. A feed water preheater of 1,375 sq ft to operate at 2,200 lb/sq in is being made for the Battersea "B" (No. 5) boiler, while other partly constructed plant includes thermo-compression central evaporating plant of 45,000 lb/hr for Deptford (East) and rotary water strainers of 2.6 million gal/hr capacity as well as a twin-shell condenser of 50,000 sq ft for the Bankside (No. 1) 60 MW turbo-generator. An order for a 60 MW turbo-generator that is to be hydrogen cooled is likely to be of particular interest.

Turbines and alternators built at Hartlepool are made under licence agreements with Brown, Boveri & Co., Ltd., Baden, Switzerland, but not all the large turbines at present being constructed will be coupled to alternators of Westgarth manufacture. Similarly, condensers and feed heating systems corresponding to 800 MW are in hand, of which 300 MW is being made for other manufacturers.

The largest single-shell condenser at present on order is a repeat of that supplied to the former London Power Co. before the war for the Battersea "B" high-pressure (No. 4) turbo-generator. It consists of a single shell of 70,000 sq ft surface with a six-stage feed heating system and a de-aerator for 1,000,000 lb/hr maximum throughput.

Some of the twenty smaller turbines

with a combined rating of 100,000 kW being made for industrial users are back-pressure sets and other special types of turbo-alternators for chemical works. The remainder will drive compressors and blast-furnace blowers, the latter also to be made at Hartlepool. All these machines, except one set, are designed for steam at 600 lb/sq in and upward, which fact illustrates how industrial users are striving to secure more efficiency from the higher thermal cycles, which have not been without effect, too, on ships' equipment.



Three-cylinder 32 MW turbine for Rye House No. 1 machine

Though most of this group's marine work is concentrated at Wallsend-on-Tyne and Sunderland, it has engineering works at Middlesbrough and still schedules some of its marine orders to Hartlepool. Four opposed-piston Doxford two-cycle oil engines ranging up to 5,000 s.h.p. are built there each year and 68 marine water-tube boilers are at present in hand.

Land boilers, Foster Wheeler type, are in commission and under construction for 1,000,000 lb/hr evaporation. Most are in the 600 lb/sq in at 800 deg F range and one, in commission, is operating at 1,200 lb/sq in and 950 deg F.

Several sets of complete geared turbines for ship propulsion are in hand. A recent order is for the building of six sets of reheated steam machinery for colliers required for the B.E.A. programme.

The Supervising Engineer

His Part in Securing Increased Production

SPEAKING at the annual conference of the Association of Supervising Electrical Engineers in London last Saturday, Mr. L. R. Perkins, the chairman, said that it was in removing the suspicion which still affected the attitude of the operatives towards the employer and in creating the better spirit which was essential for increased production, that the supervising engineer could play such an important part. He must do everything in his power to provide continuity of employment so that the operatives might be assured that they would not be paid off immediately the job was finished.

The supervising engineer must convince the employer that, in the long run, good conditions and continuity of employment would bring their own reward. Work would be completed to time and men would work willingly under occasional bad conditions which would in less happy circumstances result in the work being brought to a standstill.

Where he had control over estimating, the supervising engineer could play an important part in the quest for better conditions by refusing to cut prices and by allowing sufficient cover to provide for reasonable overheads and welfare arrangements. The tendency at first would be to force prices up, but this would soon be more than counterbalanced by increased efficiency and output from operatives. The client in turn would reap the benefit of better workmanship with reduced maintenance costs.

Views on the News

By REFLECTOR

ONE possible consequence of nationalization feared by people in the electricity supply industry was a "general post" involving transfers all over the country. So far I have heard very few complaints that men have had to tear up their roots and transplant themselves elsewhere. I know that it happened in the case of some of the more senior officials in the early days. For instance, some had to move from Yorkshire to the South Coast. Generally speaking, most employees remained in their jobs or at least in their districts. Mr. C. T. Melling, chairman of the Eastern Electricity Board, promised at vesting date that movements of staff from one district to another would be avoided as far as possible and now he has repeated that assurance. Where a transfer is necessary, he says, it will be accomplished with as little hardship as possible.

★ ★ ★

Last week a letter was published from Mr. C. H. Smith (Heatrae, Ltd.) commenting on my note on the way some water heater makers have got round the purchase tax. His views are now endorsed by the Electric Water Heater Manufacturers' Association, which tells me that when evasions occur the Customs and Excise authorities naturally take preventive action, after consultation with the Association. It says: "Purchase tax on electric water heaters is already sufficiently onerous and this Association is most anxious that no further burdens should be placed on this industry."

★ ★ ★

It must have been with a feeling of elation that the 400 delegates have been attending the sales management conference arranged by the British Electrical Development Association in London this week. For the first time for ten years they are now being permitted, even encouraged, to perform their proper function, namely to promote the sales of electricity. True, to start with, they must confine their activities primarily to developing off-peak loads, but, with the somewhat belated official discovery that certain loads hitherto frowned on are in fact largely off-peak, they will no doubt find quite a bit of scope for their energies. Water heating in particular appears to offer a promising field for development and it is to be hoped that further tangible proof of official encouragement will be given by at any rate a reduction if not removal of purchase tax.

★ ★ ★

In the Government's latest popular pamphlet on the national economy, "The Budget and Your Pocket," the various forms of taxation are enumerated. I consider it rather unfortunate that in the examples given of goods upon which 100 per cent purchase tax is charged electric water heaters should be bracketed with furs and mirrors. Otherwise the national finances are explained very well, although after reading the booklet one can appreciate why economics has been termed the "dismal science."

★ ★ ★

A correspondent to the *Spectator* declaims against the extravagant expenditure upon new schools. In one primary school in Devon, he says, "the electric equipment in the canteen is said to take as much current as the entire village of 800." All I can say is that the canteen must be extremely well equipped or else the village very much under-developed electrically and the South Western Electricity Board should attend to it.

★ ★ ★

The "Miscellany" column of the *Manchester Guardian* finds novelty in the (to engineers) familiar phrase "tripped out" used in an official explanation of a recent supply failure. "Who," it is asked, "could be cross . . . when it is so charmingly expressed? It sounds such a coy and girlish departure."

★ ★ ★

From a recent issue of the New York *Electrical World*:—

> "No matter what American utilities say they are just common ordinary commercial enterprises without social class or distinction. In Britain, the British Electricity Authority has applied to the College of Arms for its own armorial insignia. And will those British generators look down on their American counterparts who have to operate without a coat of arms?"

Electric Vehicles

ASSOCIATION'S ANNUAL LUNCHEON

MANY well-known members of the electrical industry attended the annual luncheon of the Electric Vehicle Association of Great Britain at the Connaught Rooms, London, on 18th May. The chair was taken by the president, Mr. A. W. Barham and the guests included Sir Cyril Hurcomb, chairman, British Transport Commission, Lord Citrine, chairman, British Electricity Authority, Mr. A. Robens, Parliamentary Secretary to the Ministry of Fuel and Power, and several chairmen of Electricity Boards and principal B.E.A. officers.

Sir Cyril Hurcomb, who was introduced by Mr. Barham, proposed the toast "The Electric Vehicle." He considered it unusual to propose the health of an inanimate object and went on to say that as chairman of the Electricity Commission he advocated greater use of electric vehicles, and even dared to suggest that electricity supply authorities might make greater use of them.

In a reference to passenger transport, Sir Cyril referred to the decision to replace London trams by trolley-buses and said that this replacement probably represented the limit of the sphere of operation of the trolley-bus. There were, he said, substantial advantages in the use of oil-engined buses throughout the system. Nevertheless, the British Transport Commission would look very carefully into any proposals for converting trams into anything but trolley-buses and would come to no decision without consulting the British Electricity Authority.

He need not emphasize the proved usefulness of the battery vehicle for goods transport requiring comparatively low mileages and frequent stops. The balance between coal and oil had wavered in recent years, but he suspected that we might now be on the point of coming down in favour of the use of low-grade coal, and this could best be done in a power station—better than in a locomotive.

The progressive use of electric vehicles depended upon reduction of the cost and weight of batteries, standardization of sizes and voltages of motors, and adequate facilities for battery charging to extend the range of vehicles above the present 30-40 miles a day.

As an owner and operator of road transport vehicles the British Transport Commission was interested in the technical development of road vehicles and could manufacture prototypes or collaborate with the commercial research and development organizations in industry which had been working on the problem for some time.

The Commission's road-haulage activities were entrusted to the Road Transport Executive and there was possible scope for more electric vehicles. The Railway Executive employed a substantial number of road vehicles for collection and delivery services; at present it operated nearly thirty electric vehicles and had been considering extended use. The former railway companies had found that although capital costs were higher the total running costs of electric vehicles could be lower than that of petrol vehicles for certain forms of railway work. As a result certain manufac-

Sir Cyril Hurcomb speaking at the Luncheon

Left to right: Mr. M. P. Murray (Ministry of Fuel and Power), Mr. E. R. Wilkinson (Commercial Manager, B.E.A.), Sir John Kennedy (The new president of the E.V.A.), Mr. P. Rochs (Chairman, E.V.A.), Sir Cyril Hurcomb (Chairman, British Transport Commission), Mr. A. W. Barham (retiring president, E.V.A.), Lord Citrine (Chairman, B.E.A.) and Mr. Alfred Robens (Parliamentary Secretary, Ministry of Fuel and Power)

turers were invited to interest themselves in the production of electric vehicles specially suited to railway requirements. Particular attention was being given to the evolution of an electrically driven "mechanical horse," and two prototypes were being tried out on railway delivery and collection. Another firm was converting a 3-ton mechanical horse to electric traction. One of the leading makers had in hand the production of two capacities of parcels van which would be put into experimental service. British Railways had authorized the purchase of six experimental battery-driven vehicles and would thus have eight experimental models at work.

Apart from these specially evolved types, they had much to learn from the experimental operation of various makes of vehicles now on the market or in prospect. The railway still had 7,000 horses, many of which would be retired as soon as the most economical mechanical substitute was found, and even petrol vehicles might be eventually replaced by suitable electric vehicles if that proved to be the best and cheapest course.

Sir Cyril said that he believed that electric vehicles could often offer technical advantages at prices equal to or lower than those of vehicles driven by imported oil. He looked hopefully towards Lord Citrine for the encouragement of the electric vehicle by the offering of special charges for electricity.

In his response to the toast, Mr. Peter Rochs (chairman of the Association) referred to figures which he had given at last year's luncheon and said that since then the number of electric vehicles in use had risen from 10,000 to 13,000. These required 104 million kWh a year, providing the supply authorities with a revenue (at ¾d per kWh) of £325,000. This saved 12.35 million gallons of petrol, representing $1.73 million.

Vehicle makers asked the British Electricity Authority to establish a standard price for electricity for battery charging and to allow adequate periods during which off-peak rates were available. Battery charging was a very desirable load so far as supply engineers were concerned.

As an example to illustrate the present anomalous position Mr. Rochs quoted the case of a large user of electric vehicles with 26 depots and branches who paid 23 different average charges varying from 0.75d to over 2d per kWh; in only five cases was the rate under 1d per kWh. In many instances, he said, while the unit charge might be relatively low, there were hire charges, maximum demand charges and surcharges of various descriptions which raised the price of energy to a figure which was detrimental to the development of the electric vehicle. How many people realized that if the price of electricity was raised from ½d to 1d the running costs of the electric vehicle would be increased by 32 per cent?

The charging of an average 240 Ah battery took twelve hours at the proper charging rate. That meant that it was necessary to have it in circuit partly outside the off-peak hours, often at a "dangerously uneconomic" rate per unit. It was thus necessary for the supply authorities to have proper regard to the time from which the off-peak rate commenced.

The speaker considered that the presence of Lord Citrine at the luncheon strengthened his belief that representations which the Association was to make to the B.E.A. would result in securing the Authority's guidance and help. In regretting Lord Hyndley's absence through indisposition, he hoped electric vehicles might be increasingly used to carry coal to the householder as other commodities were carried. Mr. Rochs also considered that there was great scope for the electric vehicle in the postal service.

ANNUAL MEETING

In the report which was presented at the annual meeting held after the luncheon mention is made of several exhibitions at which, in conjunction with the Electrical Development Association, members showed vehicles. It was decided that standardization was best dealt with by the British Standards Institution, and the Standardization Sub-Committee was therefore discontinued. The B.S.I. has been asked to consider the appointment of a committee to deal with the standardization of batteries and battery boxes.

The Manufacturers' Sub-Committee investigated the desirability of standardizing certain components and accessories, and it was decided to obtain the views of the manufacturers' technical experts before submitting proposals to the B.S.I.

Appreciation is expressed in the report of the support received from the Electrical Development Association.

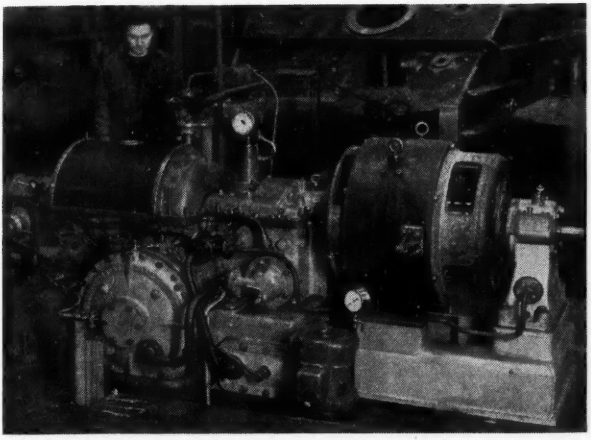
Statistics published by the Ministries of Transport and Supply show that the bulk of the 3,437 new electric vehicle registrations were in the 12 cwt-1 ton class (1,783) and the 1-1½ ton class (1,090). There were seven of over five tons. In addition 1,455 pedestrian-operated "prams" and 351 invalid chairs were registered. A table shows that the number of electric vehicles in use rose from 4,156 in 1938 to 12,856 in 1948—the greatest annual advance (2,877) being made in the latter year. These figures do not include pedestrian-operated "prams." Production of electric vehicles (excluding "prams") in 1948 was 3,959.

Small Turbo-Generators

50 kW SETS FOR PRESENTATION TO UNIVERSITIES FOR INSTRUCTION

THIS year C. A. Parsons & Co., Ltd., are celebrating sixty years of turbo-alternator building, during which period the machines constructed at the Heaton works have increased in size from 75 kW to 100,000 kW.

It is a happy coincidence that in this, its diamond jubilee year, the company should be presenting to universities in different parts of the world turbo-generators incorporating all the latest developments, which will enable students in electrical and mechanical engineering to receive training on modern plant. Each set is equipped with all the necessary accessories, including surface condenser, air ejector and pumps. The impulse reaction turbine, running at 8,000 r.p.m., drives through single-reduction double-helical gearing a d.c. generator at 3,000 r.p.m.



Impulse-reaction 50 kW Parsons turbo-dynamo for university instruction

A single iron casting forms the bottom half of the cylinder containing the reaction blading, the surface condenser, gear case bottom half and the bedplate. A separate steam end portion incorporates the combined runaway stop valve, the governor valve, impulse nozzle and blading and bottom half dummies. The main bedplate sits directly on the foundation block and has bolted to it an extension bedplate for the generator. To accommodate the condensate extraction pump with its discharge pipe, a local excavation to a depth of 18 in is required. It is suitable for steam at 100 to 200 lb/sq in from saturation up to 450°F. Variation of steam conditions to suit individual requirements is accommodated by changing the nozzle block, while the blading remains unaltered. There are fourteen pairs of rows of reaction blading, all of the end-tightened type, made of stainless iron throughout.

An emergency stop valve and a governor valve are arranged horizontally in line in the cylinder steam inlet. An emergency governor on the end of the shaft will trip, mechanically, the stop valve in the event of the machine exceeding a predetermined speed. The governor valve is actuated directly from a centrifugal governor on a cross shaft which is driven at 2,000 r.p.m. by a worm and wormwheel reduction gear from the turbine shaft. A hand regulating gear enables the speed at any load to be set to any desired figure within the range of regulation.

The cross shaft also carries a lubricating oil pump of the gear wheel type and, for starting purposes, a hand-operated oil pump is provided. The oil tank is in the bedplate.

The surface condenser, which is crosswise beneath the exhaust, is of the two-flow type and has a cooling surface of 90 sq ft. It maintains a vacuum of 26 in Hg (baro. 30 in) with cooling water at 75°F. A motor-driven condensate extraction pump is provided, and also a two-stage steam-jet air ejector.

The generator is shunt connected and compound wound, of 50 kW at 240 V. Electrical sheet steel laminations are used for the armature core and they are assembled directly on to the steel shaft. Light alloy rings support the core at the ends, and also the end windings. Insulation is moulded on to these end rings so that the maximum leakage surface is attained. The insulation on the coreplate is varnish, stoved at a high temperature. The armature conductors are insulated with moulded micanite,

held in position in semi-closed slots by bakelized linen wedges. The commutator is of the shrink-ring type having solid risers integral with the segments, which prevent the ingress of carbon dust into the windings.

The magnet yoke is of cast iron and has end shields at both ends, which are supported in roller bearings to enable the generator to be used as a dynamometer to measure, accurately, the total output from the turbine. Ventilating air is supplied by an axial flow fan fitted at the turbine end of the armature shaft, the air after cooling the field winding and armature being directed on to the commutator before exhausting to atmosphere.

Special features are embodied for instructional facilities. The generator casing is mounted in trunnions and carries a torque arm, thus contributing a dynamometer suspension whereby the power at the coupling can be determined. In addition to the normal series turns in each interpole there is a separately excited auxiliary winding, controlled by a potentiometer rheostat, to permit the effect of interpole field strength adjustment on commutation to be observed. The leads and terminals are so arranged that the compounding windings may be diverted or disconnected, as desired, to demonstrate the characteristics of shunt and compound wound generators. Ample provision is made for pressure and vacuum gauge connections and thermometer pockets.

Consulting Engineers

MINISTER OF SUPPLY AT ASSOCIATION'S ANNUAL DINNER

A FEATURE of a speech by the Minister of Supply, Mr. G. R. Strauss, in proposing the toast of "The Association of Consulting Engineers," at the annual dinner of that body on 19th May, was the emphasis which he laid on the importance of the Canadian market. Great Britain, he said, had the advantages of the goodwill of Canada and a desire to purchase our goods in exchange for Canadian products. Many large works would be undertaken in Canada in the near future. To share in these British manufacturers must convince Canada that they could do the job well at competitive prices.

In this field consulting engineers could materially help, but they must advertise their ability to do so and co-operate with each other in groups and with manufacturers' representatives on the spot. He commended the idea of publishing a Consultants' "Who's Who" shortly. Mr. Strauss said that during visits to works he had been impressed with the achievements of the engineering industry (which, incidentally, was represented by from 100 to 200 associations), including greater economy in the use of steel and the extension of welding. High targets had been met and often exceeded, and engineering exports formed 37 per cent of the post-war total. Much depended upon consultants who could get up-to-date information from all parts of the world.

Responding, Mr. G. Kenyon Bell (president) said that to secure work abroad, the spirit of the old merchant venturers was necessary within the limits set by others. The Association's high code, though it had stood the test of years, should be a model not a master, and might have to be adjusted for dealing with conditions abroad. Closer association would then be necessary with contractors and industrialists.

The health of "Our Guests" was proposed by Mr. G. M. C. Taylor, on whose behalf thanks were returned by Mr. V. K. Krishna Menon (High Commissioner for India) and Sir Cyril Hurcomb (chairman, British Transport Commission). Mr. Krishna Menon urged that both countries should consider the present and the future, and not the past and this would set an example to the world. The immediate problem was the feeding of millions and giving them greater opportunities in life. In this British engineers could be of the greatest help to India in aiding her self-development. About three million kW was required there now and ten times that amount within a few years.

Sir Cyril Hurcomb drew attention to the value of engaging impartial consulting engineers with their world-wide experience to supervise public works of especial difficulty. Such a course prevented an organization from becoming too self-sufficing. Also, one of the best ways of advertising the merits of consulting engineers overseas was to set the example of using them at home. British Railways, for example, had asked Mr. Francis Lydall to advise them on electrification without branching out too far in present circumstances. Consulting engineers had also been retained in connection with a Report to the Minister of Transport regarding urgent needs in the London area.

I.E.E. Radio Section

THE Committee of the Radio Section of the Institution of Electrical Engineers announces that circumstances have arisen which make it impracticable to arrange the summer visit in June.

Sales Management

BIG ATTENDANCE AT THE E.D.A. CONFERENCE THIS WEEK

OVER 400 delegates have been attending the Sales Management Conference which the British Electrical Development Association has been holding this week at Caxton Hall, Westminster.

In welcoming the delegates Mr. V. W. Dale, general manager and secretary of E.D.A., commented on the fact that the record number attending was nearly double that of pre-war years. This, he said, was evidence of the general feeling that the E.D.A. salesmanship activities had their place in the electricity supply industry.

Officially opening the conference, Sir Henry Self, deputy chairman, British Electricity Authority, declared that the conference showed very clearly the broad interest of the Electricity Boards regarding salesmanship, free expression of opinions, and exchange of ideas, and also their attitude towards E.D.A. The conference itself demonstrated the value of the Association. The electricity supply industry had now passed through its transition period and had reached a standard of organization which made possible the next step forward.

Salesmanship in the industry was now necessary if the price level of electricity was to be maintained, and success depended on how the sales authorities could increase the overall load factor. It was necessary to get a return sufficient to justify the investment of the nation's capital, and for the first time for ten years they had to persuade people to use more electricity, so long as it was off peak. The attitude of the B.E.A. and the Boards was that if the industry could make the most of what was available it would be able to burst the economic straitjacket and go ahead with providing the facilities needed. The industry was not going to play for safety and wait for demand but was going ahead with creative enterprise.

Consumer Relations

In the first paper, MR. J. H. ADDENBROOKE and MR. A. G. F. PALLISTER (Midlands Electricity Board) dealt with the training of electricity supply staff in consumer relations. Training, they said, should fall broadly into two classes; that which gave background and encouraged the spirit of service, the right approach to and the reception of consumers; and the other dealing with the sale, construction and characteristics of appliances.

The Area Boards' standing with the consumer was influenced by the contacts made with him and it was essential that the good relationship that had been built up over many years should continue and be improved to deal with the present-day conditions.

The authors believed that the time had come when the B.E.A. and Area Boards could no longer rely for the training of their staffs in consumer relations on example or, for that matter, on the necessarily spasmodic efforts of other bodies. They were convinced that with the new set-up and, with it, the new outlook of employees, it was essential to have a direct and objective approach to the problem, if the Boards were to carry out to the full their duties of public service. For this reason they advocated the setting up of a Service Training Centre.

Rural Electrification

"Planning Rural Development" was the subject of a paper by MR. C. H. A. COLLYNS (South East Scotland Electricity Board), who pointed out that post-war economic difficulties and world's food shortage had driven home the sheer necessity for developing agriculture, and that electricity could provide the amenities that would help to arrest the drift from the land. Furthermore, a shortage of manpower could be offset by the electrical equivalent of horsepower.

The creation of satellite towns might make easier the economic aspect of extending the transmission network into sparsely populated rural areas. Now, too, that the burden could be shared over large areas where there was a considerable diversity of use, it should be possible to exercise that breadth of vision in planning and to provide an abundant supply to the rural areas without increasing appreciably the cost to the urban community. It was likely that the rural consumer would eventually use sufficient electricity to turn an initial loss on supply into an ultimately sound economic proposition.

The master plan of rural development would take some time to create and even then it would be subject to many changes due to unexpected developments outside the industry's control. Meanwhile, district men should have the master plan unfolded to them as it developed. They should be encouraged to attract enquiries to their district offices rather than direct to H.Q. Consumers should be encouraged to get in touch with the men on the spot.

Speaking on "Electricity Service Centres," MR. A. W. BONELL (London Electricity Board), said that the Centre was

the focal point for all consumers in their dealings with the Electricity Boards, and that it was on the service received that the reputation of the Boards as a whole was usually founded.

With regard to the question of supply, particularly where an extension of mains or a new service was involved, Mr. Bonell felt that a programme covering the entire district could be worked out and made available to every assistant so that he could at least give some idea when, if ever, the supply would be made available at that point. In addition there should be standard charges for service costs based on the foot run, so that this information could be given at the time of inquiry. There should be on the premises some means of carrying out small adjustments and minor repairs.

Dealing with "Present-Day Publicity Problems," MR. C. H. HARDIE (Eastern Electricity Board), declared that the partial clearance of war and post-war restrictions had placed the electricity supply industry in a dangerous position. Their publicity, salesmanship, development and even their future had the cold hand of load spreading and load shedding at their throat, while their competitors, free from such incubus, were outstripping them. While, however, the generating plant position prevented their going all out for new business, there yet remained a large and legitimate field of business in the replacement of old appliances (nearly all major appliances were now over ten years old) and the development of those appliances with low loadings and off-peak characteristics.

Hire-purchase Essential

Goods generally—even those in short supply—were no longer selling themselves. Money was not so plentiful and buyers were more discriminating. The need for salesmanship, absent for years, had returned. If they were to make the most of their limited opportunities, salesmanship of a higher order would be required. Prices were much higher all round than pre-war, and though wages, too, had risen, it was not going to be easy to sell high-priced appliances in quantity. Hire-purchase schemes would be essential and so would outside representatives. Their selling staff would need the help of vigorous publicity.

A paper by MR. J. I. BERNARD (E.D.A.), on "The Development of Off-peak Load," contained many practical suggestions. He said that every unit of electricity consumed during the night or during the mid-day "valley" was an asset from both the distribution and generation points of view. The reduced load in summer provided the only opportunity for the major overhaul of generating plant, but from the point of view of an Area Board purchasing energy on a tariff which showed no saving for a reduced demand during the summer, all additional summer load was off-peak load, which was worth developing up to the limit of the winter maximum demand. The use of electricity for all purposes in holiday camps, hotels, clubs, swimming pools, etc., which were not open in the winter, might therefore be encouraged in every possible way, including tariffs with fixed charges.

Scope for Off-peak Loads

Broadly speaking, the only loads which could be changed from peak-incident to off-peak were those which involved storage. Storage might be in the form of the product, e.g., pumped water in a reservoir, or more usually in the form of heat produced by an electric boiler or other form of heater. The only example of the storage of electricity as such, on any appreciable scale, was for battery vehicles.

Many industrial heating processes could be readily adapted to off-peak working; some furnaces, for example, had a large thermal capacity in relation to their ware, and time switches could be used to bring the furnaces up to temperature before the factory starting time, while heat treatment shops working on the batch method could often arrange to switch off during the first part, if not the whole of the morning. Off-peak working could usually be arranged for small boilers of the immersion heater type, a particularly favourable example being the tar boiler. Sterilizing was an ideal storage load on farms, where there was also an appreciable water heating load, some of which could be transferred to the night hours. Pig food boilers and automatic hammer mills were also capable of yielding substantial night loads, and there was scope for off-peak loads in connection with soil heating.

With regard to prospects for night tariff water heating there was undoubtedly a considerable number of residential, commercial and industrial buildings in which electric water heating at the lowest possible cost would be appreciated. Space heating, if supplied only during the night even at a very low rate per unit, would yield profitable revenue.

An outline of the methods adopted of testing electrical domestic appliances was given by MR. RICHARD HARVEY (E.D.A.). After indicating the purpose of testing he described the various tests for mechanical strength, cord anchorage, guarding, insulation resistance, insulation breakdown, tracking, safe temperature, etc. Efficiency, efficacy and life tests provided an assessment of performance. Mr. Harvey concluded with reference to English and foreign test codes.

PERSONAL and SOCIAL

News of Men and Women of the Industry

AT the annual meeting of the Electric Vehicle Association, reported on page 897, **Sir John Kennedy** was elected president for the ensuing year. **Mr. Peter Rochs** (Austin Crompton Parkinson Electric Vehicles, Ltd.) was re-elected chairman, and the new vice-chairman is **Mr. R. Birt,** one of the E.D.A. representatives.

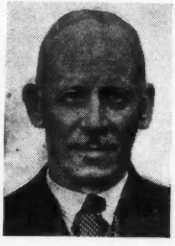
Professor J. T. Randall, Professor of Physics, London University, and **Dr. A. W. Boot** and **Professor J. Sayers,** of Birmingham University, have jointly been awarded £36,000, free of tax, by the Royal Commission on Awards to Inventors for the development of the cavity magnetron used in radar work during the war.

The North Western Electricity Board has appointed **Mr. E. G. Wardle,** A.M.I.E.E., manager-designate of the No. 2 Sub-Area, to succeed **Mr. R. C. Leslie** upon his retirement at the end of July.

Mr. Leslie joined the Lancashire Electric Power Co. in 1905, was appointed mains superintendent in 1907 and eventually mains manager in February, 1948, which position he held until being appointed manager of the No. 2 Sub-Area centred at Bolton. He was chairman of the Works Committee of the L.E.P. Mains Department, and is chairman of the M.M. Social and Athletic Club.

Mr. Wardle is mains engineer of the No. 6 (Lakeland) Sub-Area of the North Western Electricity Board. He received his technical training at Leeds Technical College and subsequently at Leeds University. After experience as a chief electrical engineer (mining) from 1925 to 1930, he was a district engineer of the Yorkshire Electric

Mr. E. G. Wardle



Mr. R. C. Leslie

Power Co. for five years, and following experience with the same company as a commercial and technical sales engineer he was appointed in 1936 resident engineer of the Mid-Cumberland Electricity Co., Ltd., and Penrith Electric Supply Co., Ltd., which position he held at vesting date. Mr. Wardle was for some time secretary and chairman of the North Midlands Students' and Graduates' Section of the Institution of Electrical Engineers. He is a member of the Association of Mining Electrical and Mechanical Engineers. From 1930 to 1935 he was an evening class lecturer in electrical engineering at Leeds Technical School.

Mr. P. E. Gaze, A.M.I.E.E., who has been engaged on the detail handling of B. T. H. switchgear work for 132 kV and lower voltages for several years, has been appointed assistant manager of the Switchgear Sales Department, Willesden. Mr. Gaze joined the British Thomson-Houston Co., Rugby, in 1930 as a student apprentice. After experience in various commercial departments, he was transferred to the Switchgear Sales Department, Willesden in 1938, and from that date until 1947 he dealt with switchgear work for many power stations and substations in this country and overseas. In 1947 he was appointed personal assistant to Mr. L. Drucquer, the manager of the B.T.H. Switchgear Sales Department.

Mr. P. E. Gaze

The annual report of W. T. Henley's Telegraph Works Co., Ltd., states that the proposed re-election of the chairman, **Sir Montague Hughman,** who has attained the age of seventy-two, will be the subject of a resolution, at the annual meeting on 10th June, of which special notice has been given to the company.

The Ministry of Labour and National Service has appointed **Mr. A. V. Wright,** A.M.I.Mech.E., to be representative in Scotland for the Technical and Scientific Register Branch of the Appointments Department. Mr. Wright, who will have his headquarters at 450, Sauchiehall Street, Glasgow, will deal with registrants for employment in the mechanical, electrical and engineering professions and will be available to give advice and guidance to graduates and to others of Technical and Scientific Register standard, as well as to professionally qualified mechanical and electrical engineers.

The Council of the Institute of Transport has elected **Brig. Gen. Sir Osborne Mance** president of the Institute for 1949-50, and he will assume office on 1st October upon

the retirement of Mr. D. R. Lamb. Sir Osborne Mance is a foundation member of the Institute.

The **Micanite & Insulators Co., Ltd.'s Long Service** Association held its annual general meeting on 12th May. The main

Major Mohr (Micanite & Insulators Co.) presenting long-service certificates

event was the presentation by Major Mohr, O.B.E., M.C., M.I.E.E., managing director, of certificates to members who had completed twenty-five years' service or more. The association membership includes eight with service of forty years or more, forty-three between thirty and forty years, and twenty-eight between twenty-five and thirty years' service.

Mr. C. W. Glanister, M.I.E.E., has been appointed chief electrical engineer to the Government of Ceylon. He received his early training with the Urban Electric Supply Co., and the Metropolitan - Vickers Electrical Co., Ltd., and his technical training at the Battersea Polytechnic. Later he was with Edmundsons and associated companies, Laurence Scott & Electromotors and the Southern Areas Electric Corporation. At the outbreak of war in 1939 he was embodied with the Royal Engineers and saw active service until 1946 when he was demobilized in the rank of lieutenant-colonel. Since 1946 he has been with the Control Commission for Germany on the control and reactivation of public utilities and has resigned to join the Ceylon Government. Mr. Glanister expects to leave this country early in July, and his address is c/o Lloyds Bank, Ltd., Godalming, Surrey.

Mr. F. Perkins, chairman and managing director of F. Perkins, Ltd., left on the *Queen Elizabeth* on 20th May for a tour of the United States and Canada with a view to extending the company's sales of diesel engines.

Mr. H. E. Bailey, manager of the Bournemouth branch of Brown Brothers, Ltd., is transferring to the sales side of the company's business, and **Mr. L. J. Curtis** has been appointed manager of the Bournemouth branch and will take up his duties on 1st June Mr. Curtis joined the company's service at its head office and is at present a senior executive at the Acton branch.

Mr. T. Eades, managing director of Automatic Telephone & Electric Co., Ltd., Liverpool, has been appointed president of Liverpool branch of the Incorporated Sales Managers' Association.

Mr. C. Eric Stewart, M.I.E.E., has been appointed general manager in India, Burma & Ceylon for Johnson & Phillips, Ltd. After leaving King's College, London University, in 1926 he joined Johnson & Phillips as a student apprentice and has been with the company for nearly twenty-

On the E.D.A.—Southern Electricity Board stand at the Oxfordshire Agricultural Show

Left to right: Mr. J. D. Markland, Mr. W. F. Poulter, Mr. H. Nimmo (chairman of the Board), Mr. H. R. J. Baigent, Mr. J. L. Taylor, Mr. R. D. Reynolds and Mr. B. W. Holborrow

three years, serving much of that time in the Contract Department. He was transferred to the Indian organization in 1945. His headquarters are at the company's head office in India, "Kaisar-i-Hind" Building, Currimbhoy Road, Ballard Estate, Bombay, India.

Mr. A. Brookes, M.Eng., M.I.E.E., special products manager of Ericsson Telephones, Ltd., has been appointed a member of the Court of Governors of the newly Chartered University of Nottingham as the representative of the Institution of Electrical Engineers. He is also a member of the Engineering Advisory Committee to the University and was a member of the Electrical Advisory Committee of the previous University College for over twenty-five years. Mr. Brookes is also a member of the East Midlands Electricity Board Consultative Council.

Mr. A. Brookes

A *Reuter* message from Melbourne states that **Mr. J. Mathelson,** former lecturer at Manchester University, has been appointed part-time commissioner of the State Electricity Commission in Victoria. Mr. Mathelson became Professor of Civil Engineering at Melbourne University early in 1947.

The Calcutta Electric Supply Corporation, Ltd., has retained the services of **Mr. Harold Hobson,** late chairman of the Central Electricity Board, in a consultative capacity to act as technical adviser to the company.

Mr. E. Morris, of Manchester, has been appointed field sales manager to the Truvox Engineering Co., Ltd. He recently resigned from the sales staff of Vactric, Ltd., after having been associated with them and their agents for twenty years. Mr. Morris will be working from the Truvox sales office at Exhibition Grounds, Wembley, Middlesex.

At the Park Hotel, Cardiff, on 20th May, the South Wales Branch of the **Purchasing Officers' Association** entertained the National Council of the Association to dinner. The toast of the Association was proposed by Mr. N. R. R. Brooke director of Guest, Keen and Nettlefolds (South Wales), Ltd., who said that the importance of an efficient purchasing department in any organization could not be too strongly emphasized. The sellers' market conditions which had prevailed for the last ten years were now fast disappearing and buying was no longer a question of obtaining delivery on almost any terms. He therefore particularly welcomed the Association's education and training scheme, which would enable young buyers to be given valuable theoretical training to supplement their practical experience. The president of the Association (Mr. F. O. Ashmore, of the Calico Printers Association, Ltd.) replied to this toast and called attention to the rapidly increasing recognition which the Association, with a membership of 2,000 and with twenty-four branches and groups in the principal centres of the country, was now receiving.

The annual golf competition for the Hutcheson Winning Trophy, organized by the **I.E.E. Scottish Centre Committee** will this year cover three distinct areas—N.E. Scotland Sub-Centre, Glasgow & District, and Edinburgh & District. Members wishing to take part should notify either Mr. J. A. Croucher, 106, Kylepark Drive, Uddingston (Glasgow & District), or Mr. A. R. S. Robertson, 15, Telford Road, Blackhall, Edinburgh (Edinburgh & District), by 30th May. The N.E. Scotland Sub-Centre has made its own arrangements for its area match.

The **British Thomson-Houston Co., Ltd.,** opened its first provincial office—in Sheffield—fifty years ago this month. This jubilee has been celebrated by the company's entertaining the staff to a supper dance at the Arcade Restaurant, Eccleshall Road. Among those present were eight whose combined service totals 250 years, including Mr. C. A. Russell, manager, Sheffield District Office (thirty-seven years' service).

A large number of **Ekco Social and Sports Club** members with their guests were early visitors at Southend Central Station on Saturday, 21st May, when the Club held its annual outing. A special corridor train took the party which included Mr. R. Laird, the Club's chairman and personnel manager of the company, to Southsea.

Obituary

Mr. H. H. Watson.—The death occurred at his home, Green Gates, Ledbury Road, Hereford, on 14th May, at the age of seventy-four, of Mr. H. H. Watson, for many years district manager, Hereford, of the Shropshire, Worcestershire and Staffordshire Electric Power Co. Mr. Watson had a long association with the electricity supply service in Hereford. He was deputy electrical engineer, under Mr. G. D. Coe, of the Hereford Corporation electricity works when it was taken over by the S.W. & S. Co. in 1930.

Mr. W. Nithsdale.—The death has occurred at London at the age of forty-eight of Mr. William Nithsdale, former resident director at Hartlepool for Richardsons

Westgarth and Co., Ltd. He left the company to begin business as a consulting engineer in London.

Mr. L. R. Farrell.—The death occurred in Bristol on 15th May of Mr. Lionel Randolph Farrell, manager of the B.T.H. Bristol District Sub-office. Mr. Farrell was born in 1899 at Saltburn-by-Sea, Yorkshire. He studied at University College, Southampton, and obtained the college diploma in electrical engineering, later joining the British Thomson-Houston Co., serving as a tester. In 1930 he transferred to the Industrial Sales Department, and in 1933 was appointed to the Bristol District Sub-office, where he remained until his death.

The late Mr. L. R. Farrell

Wills

Mr. G. S. Harvey, manager of the Exide service stations in Great Britain (Chloride Electrical Storage Co., Ltd.), who died on 15th February, 1948, intestate, left estate in Great Britain valued at £2,208 gross (£1,685 net).

Major H. T. Edwards, of Pirelli-General Cable Works, Ltd., Southampton, electrical engineer, who died on 9th February last, left £7,706 gross (£7,606 net).

Mr. A. T. Birkby, managing director of Birkby's, Ltd., left £145,813 gross (£143,088 net).

Peat-Fuel Research

THE Government is to finance peat-fuel research with an initial sum of £50,000. This decision was announced by Sir Stafford Cripps when speaking in Edinburgh, and confirms earlier reports that Government support was pending.

Three main lines of development are planned. The North of Scotland Hydro Electric Board will place a contract for the construction of a close-cycle gas turbine plant burning peat; the Ministry of Fuel and Power will place a similar contract for an open-cycle gas turbine burning peat; and the Department of Agriculture for Scotland will initiate a major survey of Scottish peat resources including the development of mechanized methods of handling. The sum of £50,000 will be made available from the Development Fund and further grants are anticipated as this work proceeds.

Further details given in Edinburgh indicate that the Scottish Home Department originally visualized a scheme whereby peat would be milled by a mechanical process and be treated in a central plant for the extraction of waxes and by-products before its use as fuel for the generation of electricity; or alternatively conversion into briquettes. The high cost of such a scheme (in the region of £2,500,000) encouraged research into other possibilities and this ultimately initiated the prospect of burning peat in a gas turbine for generation of electricity.

Power Shortage in Israel

DRASTIC measures to cut daytime consumption have been enforced by the Palestine Electric Corporation, states our Tel Aviv correspondent. In 1945 the company took steps to double its generating plant and a considerable portion of the extensions will be completed by the end of the current year, but augmented immigration and the development of new areas have greatly increased the demand.

To prevent serious interruptions during the summer, the company has found it necessary to regulate consumption for the next few months, during certain hours of the day, and an order, restricting the use of electrical energy, came into force on 15th May. The use of electric stoves, irons and household utensils is prohibited from 7.30 to 11 a.m., and industry is without electricity between noon and 1 p.m. There will be no restrictions on refrigerators, radio sets, ventilators, medical appliances and sterilizers. Water pumping for the purpose of irrigation and water supply is cut by an hour a day while water pumping for irrigating citrus groves only is restricted on Fridays from 7 a.m. to 1 p.m. Officers of the company with power to cut off the supply to offenders will carry out inspections of consumers' premises.

The cuts do not apply to Jerusalem, which is served by the Jerusalem Electric Corporation, a representative of which has stated that as much power as the city required could be supplied. In fact, less than 75 per cent of the station's output is being used. Sir Clarmont Skrine, a director of the Jerusalem Electric Corporation, visited the Jerusalem area, as well as the Arab districts of Ramallah, Bethlehem and the Old City of Jerusalem during the past few days to get a first-hand view of the company's affairs. During his stay in Jerusalem he saw Government and municipal authorities and the discussions were reported to be "satisfactory." The Arab Press reported that Sir Clarmont discussed with Abdullah el Tel, the Arab Governor of the Old City of Jerusalem, the question of supplying the Arab areas.

E.T.U. Conference

WIDE SCOPE OF DISCUSSIONS

OVER 250 resolutions appeared on the agenda for the annual policy conference of the Electrical Trades Union at Worthing this week. They covered a great variety of subjects, industrial, economic and political, and the following is a brief summary of those of interest to other sections of the electrical industry.

Wages and conditions in the electrical contracting industry formed the subject of about 50 items. Many branches put forward resolutions advocating a national uniform wage rate, several suggesting the London rate as a basis, and it was proposed that the present "hourly addition" should be consolidated with the basic rates. Demands were made for increased "country" allowances, allowances for working away from the shop, and payment for travelling time, The improvement and widening of the holidays-with-pay arrangements and a sick pay scheme formed further subjects of debate.

Limitations upon the permitted number of apprentices in relation to journeymen employed, higher pay for apprentices and a review of the Union's policy regarding boy labour were called for. Two resolutions urged the Executive Council to press for a national register of electricians, and in another statutory regulations were advocated.

Several motions relating to the electricity supply industry called for the raising of wages of workmen to the same level as those of clerical and other workers. A uniform national rate was also favoured. Other proposals were that shift workers should receive overtime payment in respect of work at week-ends and on Bank Holidays. Higher pay was advocated for substation attendants and meter readers, and it was thought that linesmen should be classed as skilled mechanics.

Some branches wanted a national wages agreement for the radio industry; others considered that railway generation staffs should be on a level footing with their counterparts in the electricity supply industry. Uniform rates of pay for electricians and mates in Government Departments, and in the road transport industry were called for.

The British Electricity Authority was urged to use its manufacturing powers to the maximum extent and to take full advantage of its powers to establish contracting departments. Complaints were voiced about the placing of representatives of "the old reactionary managements" in executive positions, and direct representation of trade unions on Area Boards was advocated. Attention was called to the increasing number of officials in the electricity supply industry. The B.E.A. was urged to set up a training scheme for manual workers.

Suggestions were put forward for negotiations with the Electrical Power Engineers' Association for fusion with the E.T.U. and for the absorption by the E.T.U. of the A.S.E.E. and other similar organizations. A single N.J.I.C. for all electrical workers was proposed by another branch.

Executive Council's Report

During the week the Executive Council's report on the past year's activities has been presented in conjunction with members' resolutions. The report is a document of about 130 pages giving in some detail particulars of negotiations regarding wages and conditions. It is not possible here to do more than touch upon one or two of the matters dealt with.

Membership rose by over 11,000 during 1948 and was 181,755, in 583 branches, at the end of the year. It is noted that the Union has established a convalescent home at Rustington, Sussex, and a residential training college accommodating about thirty is being opened for the training of shop stewards and officials of the Union.

Particulars are given of discussions with the National Federated Electrical Association on wages, apprenticeship, London working rules and travelling time. These are followed by details of negotiations with the British Electricity Authority through the reconstituted N.J.I.C. of the electricity supply industry. Several pages are devoted to a record of activities in connection with wages in the engineering and shipbuilding industries, and there follow accounts of negotiations on wages and conditions in railway establishments, the cable-making industry and in thirteen other industries, the Admiralty and the Ministries of Supply and Works.

More general matters are covered in the third section of the report. Among them is compulsory registration of electrical contractors and operatives. Last year the Council was asked to pursue this question, but it has decided that at present it is sufficient to make approaches to the B.E.A. or the Government with a view to securing regutions and safeguards in respect of electrical installations. The Union has claimed to be considered the sole negotiating body in connection with the payment of electricians employed in the electrical contracting departments of the Electricity Boards, but so far has not succeeded in establishing the claim. The Executive Council has reserved its

decision upon support or otherwise of the Trades Union Congress policy on production and wages, and has called for a complete change of Government policy in relation to wage stabilization, a national economic plan and foreign policy.

In his address at the opening of the conference on Monday the general president (Mr. Frank Foulkes) commented on the rapid growth of membership and its democratic control. He said that the Union still refused to accept the policy of "wage freezing" until the wages of the greater proportion of the community had been substantially increased and he detailed the increases which the Union had obtained in about a dozen branches of industry.

Mr. Foulkes expressed dissatisfaction with the methods adopted in nationalizing industries, considering that the employees should secure greater benefits and be given a greater measure of management and control.

At the Tuesday morning session there was a discussion on the installation departments of Electricity Boards. Several speakers contended that prices quoted for work were deliberately inflated to divert the work to private contractors, and there were allegations of overstaffing and inefficiency.

Mr. W. C. Stevens, general secretary, said that it was the aim of the Union to make these departments so efficient that they would naturally secure all the installation work available and thus nationalization of the contracting industries would be achieved.

Minister's Address

Mr. Gaitskell, Minister of Fuel and Power, addressed the conference on Tuesday morning. He defended the recent increases in electricity charges, saying that they were in no way connected with nationalization and that prices still compared most favourably with those of other commodities. He also spoke of the measures being taken to overcome the plant shortage and called on members of the E.T.U. to help to procure for the country all the plant it needed.

The case for nationalization had been mainly a technical one, for there already existed a considerable measure of public ownership and control. Nationalization had brought about larger administrative units and greater centralization of generation. The other main argument was that if in any area there was to be a monopoly it should be a public one. He claimed that improvements had already been made in operation.

After a reference to labour relations in the electricity supply industry Mr. Gaitskell said that some trade unionists were claiming direct representation on the boards of nationalized industries. He considered this very undesirable. If representatives were made full-time members of boards they ceased to be in the industry and could not be said to represent the workers. There must be two sides to a National Joint Industrial Council and a workers' representative could not sit on both sides of the Council table.

Lack of efficiency would be a powerful argument against nationalization and it was essential to avoid any blurring of responsibility in this matter. If workers' representatives were part-time members of boards they would be blamed by other members if anything went wrong. Similar considerations applied in the case of Consumers' Consultative Councils, and in any event wages and conditions were no concern of these bodies.

Consultation with Workers

The Government agreed that everything possible should be done to increase the workers' participation in nationalized industries. In electricity supply there was a National Advisory Council and there would soon be District Councils which could be used by the workers for the expression of their views. Nationalization should broaden the avenues of promotion, giving workers a better chance to rise to the highest positions.

As a Minister, he had to have regard to the public attitude towards nationalization. The public would not judge it entirely by whether the workers had benefited from it; they would want to know what *they* were getting from it.

Despite Mr. Gaitskell's views a resolution was passed at the afternoon session calling for greater trade union representation on national boards at all levels. Another resolution expressed dissatisfaction at the methods of appointment to executive positions.

Fatality

A WARNING that amateurs should avoid interfering with electrical installations was given by the Liverpool city coroner last week at an inquest on a tramcar driver who had received a fatal shock in the backyard of his home. The man's widow said that the accident occurred when her husband went to cut a piece of lead piping from a cable which a friend had installed to light an outside lavatory. Her husband wanted lead to mend a leaking bath. Mr. H. C. Nicholls of the Merseyside and North Wales Electricity Board, stated that the cable was enclosed in short lengths of iron and lead piping and must always have been a potential danger. A verdict of "Accidental death" was recorded.

Correspondence

Letters should bea ı the writers' names and addresses, not neccessarily for publication. Responsibility cannot be accepted for the opinions expressed by correspondents

Boards and Contractors

HOW right is the letter from Mr. Harry Moss in the issue of 13th May. In the Midlands we as contractors are assured that the Midlands Electricity Board wants to work hand in hand with the good contractors. Yet to-day I have received my electricity account upon which I find is printed: "Do not use portable electrical appliances in a bathroom, or earth apparatus, including radio sets, to a gas pipe. Advise us before connecting new apparatus." If the last paragraph had read "See your Electrical Contractor before connecting new apparatus," contractors would have felt the co-operation was real; as it is I am afraid it is too one-sided for me to feel it is a "Combined operation."

THOMAS R. PRIEST.

Birmingham.

Earth-leakage Trips

THE point made by "Ubique" in his letter published in your issue of 13th May is perfectly true, but surely it is a most remote possibility that the neutral should become broken simultaneously with an earth fault on the installation. With any type of earth-leakage circuit breaker, it seems to me that the possibility of the connection from the trip coil to the earth electrode becoming severed or the breaker failing to operate due to a mechanical defect is worth more consideration.

The power available mechanically to trip the type of breaker referred to by your correspondent ensures that failure to operate due to a mechanical fault such as "sticking" is also very remote.

H. W. BREEZE,
W. T. Henley's Telegraph Works Co., Ltd.

Gravesend.

I WAS interested to read the comment by "Ubique" in your issue of 13th May, as I recently came across a relay-operated earth-leakage circuit-breaker in Northern Ireland, and at once raised the point of loss of neutral mentioned by your correspondent.

Following investigation, I am informed that in the early days of the earth-leakage circuit-breaker in Germany, a relay-operated type was submitted, among others, for examination prior to licensing by the supply authority then owning the patents for this method of protection, but it was turned down on the grounds that the leakage potential alone must be relied upon for operation, without dependence upon any external agency which might, or might not, be present at the critical moment.

Our own B.S. 842/1939 does not make this point clear, however, so that a relay-operated type presumably complies.

"INTERESTED."

Zinc-Alloy Conduit Fittings

WE have read with interest the statement (6th May) on precautions to be observed in the use of light alloy conduit.

As the originators of pressure die-cast zinc alloy conduit fittings, this firm initiated inquiries with subsequent analytical tests to ascertain, in the interests of users, the lesser known features of this type of fitting. The resultant detailed report, which is always available for inspection, shows that the most efficient safeguard is to specify fittings made of "Mazark 3" zinc-base alloy and to see that they are manufactured in accordance with BS 1004.

Even then, it is possible that retarded corrosion may eventually occur if the fittings are subjected to severe abnormal

(*Continued on next page*)

MORE COPIES OF
ELECTRICAL REVIEW

The recent decision of the Government to increase the allowance of paper for technical periodicals makes it possible for more copies of the *Electrical Review* to be available commencing on 1st July.

It will still be necessary for an order to be given to your newsagent or for a direct subscription to be placed with the Publishers.

Additional copies will be limited, so order at once if you wish to be sure of copies regularly.

conditions of service, but the rate of corrosion will be negligible as compared with the rusting rate of ferrous metals. It can be minimized by the application of an insulating lacquer which, by forming an exceptionally hard, non-brittle coating, offers protection against dampness.

Regarding strength and threading, this firm has had zinc alloy conduit fittings subjected to tensile tests without distortion or fracture up to 2,000 lb, the pull being on the threads.

The application and maintenance of protective coatings and general standards of these fittings need not involve contractors in additional labour, as ranges are already available which are made with due precautions at the manufacturing source to ensure composition, durability, strength and protection.

J. T. NISBET,
Alexander Pollock & Co.

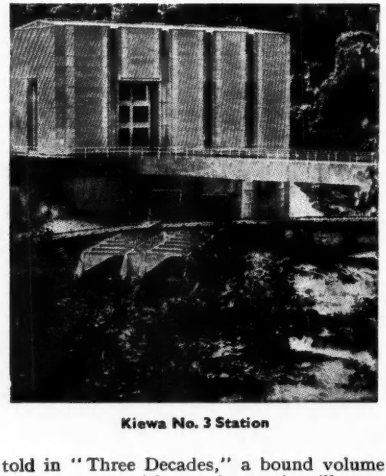
Edinburgh, 1.

[This letter has been abridged.—EDS.]

Thirty Years in Victoria

ACCOMPLISHMENTS OF STATE ELECTRICITY COMMISSION

OF the several handsome publications recording the progress of electricity authorities which we have received from time to time, none excels that of the Victorian State Electricity Commission. The story of the Commission's achievements is



Kiewa No. 3 Station

told in "Three Decades," a bound volume of 192 pages with 150 impressive illustrations, a number of them in colour.

The Premier of Victoria, the Hon. T. T. Hollway, contributes a foreword in which he underlines the importance of full development of the State's fuel and power resources—brown coal and hydro-electricity. These resources are, he says, helping the State on the road to becoming the greatest industrial force in the Commonwealth. Today the Commission, with an installed capacity of 443,000 kW, is producing about 2,000 million kWh annually, and it is also supplying a large proportion of the solid fuel consumed in the State. The Government has approved large capital expenditure on additions to the hydro-electric and thermal generating plant, exploiting another great coal deposit, and erecting additional briquetting plant.

The Bogong High Plains in the Victorian Alps are the source of the State's main hydro-electric power. The Kiewa system, when complete, will consist of six power stations with a total installed capacity of 289,000 kW, and the estimated capital cost is £25 million. All the stations except the one (No. 3) already completed will be built in large vaults hewn out of the solid rock deep underground. Nos. 2 and 4 will be 650ft and 450ft deep respectively, reached by electric lifts in vertical shafts, and Nos. 1 and 5 will be deeper still but entered by horizontal tunnels.

The first Commissioners appointed in 1919 were the late Sir Thomas R. Lyle (chairman), the late Hon. George Swinburne and Mr. (now Sir Archibald) McKinstry, the last-named serving for only a few months before returning to England. Sir Thomas Lyle was succeeded as chairman by the late Sir John Monash (1920-31) and he by Mr. F. W. Clements (1931-37). Mr. G. G. Jobbins is the present chairman. Senior officers are Mr. R. Liddelow (manager), Mr. W. J. Price (secretary and head of administration), Mr. E. Bate, M.C., chief engineer, and Mr. C. H. Kernot, deputy chief engineer.

Marconi Marine Receivers

The Marconi International Marine Communication Co., Ltd., announces that its new "Mercury" and "Electra" marine communication receivers have now gained the official certificate of type-approval issued by the Postmaster-General under the new Specification for Ships' General-Purpose Receivers.

Overseas Electrical Trade

REDUCED EXPORTS IN APRIL

ELECTRICAL equipment shared in the general fall in exports last month, but not to the same extent as some other groups. The total of £9,962,763—higher than in any month before 1949—was, in fact, not unsatisfactory, bearing in mind that the Easter holidays reduced the number of working days in April to 24 against 27 in March, and that trade was interfered with by the dock strike in London.

Less reassuring are the detailed figures. Although in the aggregate electrical exports were £1½ million more than in April, 1948, this was largely accounted for by machinery. Among goods and apparatus, nearly half the items listed in Table I show falls, in one or two cases substantial, e.g., commercial radio apparatus from £382,548 in April, 1948, to £143,926 last month. On the other hand exports of domestic radio apparatus improved and the number of sets sent overseas (35,000 units) was, with the exception of March, the highest since the beginning of last year. There were considerable fluctuations as far as individual markets were concerned. Consignments of goods (excluding machinery) to India, for instance, amounted to no less than £1,051,959 compared with only £331,443 a year ago. Pakistan added to this expansion with a rise from £17,345 to £90,331 and in the four months so far this year has taken goods to the value of £409,514—eight times as much as in the corresponding period of last year. Also on the credit side, and of interest in view of the campaign to stimulate exports to North America, is the above-the-average figure for shipments to Canada of £117,897—in March the value was only £59,542 and in April last year £88,175. Probably the greatest fall was in exports

TABLE 1.—ELECTRICAL EXPORTS

Class	April, 1949	April, 1948	Class	April, 1949	April, 1948
	£	£		£	£
Telegraph and telephone wires and cables (submarine) ...	68,213	93,607	Flat irons	27,854	25,758
Ditto, not submarine	536,198	661,685	Commercial electrical instruments	93,707	83,280
Wires and cables, rubber insulated	455,759	399,252	House service meters	130,199	202,916
Ditto cotton, silk or artificial silk insulated	59,355	52,626	Time recorders and time switches	13,465	11,219
Ditto enamel, glass or asbestos insulated	113,304	25,236	Other electrical instruments ...	61,058	77,153
Ditto, paper insulated ...	742,379	729,427	Electro-medical apparatus (not X-ray)	30,976	25,675
Ditto other	66,513	107,975	X-ray apparatus, tubes and parts	57,235	69,020
Commercial radio apparatus	143,926	382,548	Permanent magnets	11,139	12,570
Domestic radio apparatus ...	348,473	339,746	Insulating cloth and tape ...	52 744	50,838
Telegraph, telephone and signalling apparatus	1,216,593	925,978	Other insulating materials ...	69,599	95,957
Radio loudspeakers	25,284	15,811	Unclassified goods and apparatus	399,752	291,015
Sound reproducing apparatus components and parts, other than cinematograph apparatus	235,663	153,269	Generators, up to 200 kW ...	811,706	185,348
Other radio, etc., apparatus ...	48,807	50,784	Ditto over 200 kW	230,588	154,821
Radio valves	147,330	169,864	Ditto, parts	60,945	135,948
Electric lighting carbons ...	26,384	4,089	Motors, railway and tramway...	22,611	20,086
Lamps, not exceeding 24 V ...	38,518	21,136	Ditto, other up to ½ h.p. ...	95,924	45,555
Discharge lamps	28,343	39 614	Ditto, from ½ to 1 h.p. ...	52,355	38,949
Other lamps	68,738	99,757	Ditto from 1 to 250 h.p. ...	510,028	380,380
Other lighting apparatus ...	374,197	369,247	Ditto, over 250 h.p.	58,226	54,333
Primary batteries	70,717	35,175	Ditto parts	79,059	42,094
Accumulators for motor vehicles	167 714	191,046	Converting machinery ...	6,072	7,306
Ditto traction	4,647	11,011	Transformers, including coils ...	432,080	326,738
Ditto, radio	3,796	4,218	Rectifiers for power house use...	9,122	27,528
Other portable accumulators ...	50,586	57,504	Motor starting and control gear	171,598	178,162
All other accumulators ...	52,824	52,034	Switchgear and switchboards (not telegraph and telephone)	666,829	374,731
Parts and accessories	96,070	54,727	Other electrical machinery ...	28,945	23,904
Cooking appliances	118,928	153,261	Vacuum cleaners and parts ...	183,974	152,392
Heating appliances	64,660	75,343	Other electrically operated portable appliances	183,286	52,995
Parts and accessories of cooking and heating appliances ...	37 768	34,197	TOTAL	9,962,763	8,456,838

to Argentina, from £247,457 in April, 1948, to £38,404 last month.

The improvement in domestic radio receiver exports already referred to was in the main due to a sharp increase in the number sent to South Africa (13,275 against 3,121 a year ago). The value of such exports to the Union up to the end of April was £280,218 compared with £128,996 in the first four months of last year. The allied telegraph and telephone industry remains a bright feature of the export returns with a total for April of £1,216,593 against £925,978 a year ago. It is this class of goods that has been responsible for a good deal of the expansion in exports to India; the amount sent there so far this year is valued at £363,644 contrasted with £83,508 up to the end of April, 1948.

TABLE II.—DISTRIBUTION OF ELECTRICAL GOODS AND APPARATUS

Destination	April, 1949	April, 1948
	£	£
Eire	166,666	233,417
Channel Islands	23,164	31,923
Malta and Gozo	24,562	32,631
Cyprus	13,502	29,380
British West Africa	67,845	110,056
Union of South Africa ...	1,014,113	912,837
Northern Rhodesia	22,192	10,497
Southern Rhodesia	89,304	113,946
British East Africa	93,208	75,326
Bahrein Koweit, Qatar and Trucial Oman...	45 672	53,317
India	1,051,959	331,443
Pakistan	90,331	17,345
Malaya	213,591	145,968
Ceylon	43,435	43,598
Hong Kong	176,486	101,171
Australia	681,771	698,514
New Zealand	246,690	170,730
Canada	117,897	88,175
British West Indies	127,966	58 292
Anglo-Egyptian Sudan ...	19,883	34,585
Other British Countries ...	51,760	52,794
Soviet Union	37,600	15,665
Finland	15,196	39,819
Sweden	99,110	353,278
Norway	141,593	98,898
Iceland	18,805	13,851
Denmark...	72,552	80,120
Poland	144,969	77,803
Germany	19,213	15,579
Netherlands	116,909	133,252
Belgium	78,377	77 327
France	64,509	52,541
Switzerland	21,995	25,005
Portugal	59,731	127,223
Spain	15,481	6,657
Austria	15,446	12,836
Hungary	4,857	6,754
Czechoslovakia	22,028	45,976
Yugoslavia	17	49,020
Greece	77,773	39,689
Turkey	77,320	91,528
Dutch East Indies	35,626	9 526
Dutch West India Islands ...	8,717	6,068
Portuguese East India	4,738	27,743
Syria	20,915	4,278
Lebanon	16,870	20,056
Palestine	21,598	202,758
Egypt	179,098	231,178
Iraq	54,983	187,745
Iran	115,260	166,129
Burma	10,338	28,960
China	32,382	86,778
United States of America ...	13,033	29,951
Mexico	209	1,535
Colombia...	12,017	17,980
Venezuela	94,501	38,438
Chile	25,909	18,528
Brazil	34,363	113,364
Uruguay	18,782	19,773
Argentine Republic	38,404	247,457
Other Foreign Countries ...	136 194	85,457
TOTAL	6,359,415	6,255,568

The Soviet Union had the greatest share of the generating plant sent out last month with a total of £605,987 against £2,665 last year; for the first four months of this year the value of such shipments to Russia was £1,661,609 against £191,772 in January-April, 1948.) Last month's increase in generating plant exports was mainly in the under 200 kW category. Motor manufacturers have continued to do well, with exports last month valued at £818,203 compared with £581,397 in April, 1948. India was the largest buyer with £168,117 (against £95,874), followed by Australia, £143,443 (£36,649); exports were mainly in the 1-250 h.p. class. Transformers and switchgear were outstanding among "other electrical machinery" with useful increases compared with a year ago.

Imports of electrical equipment last month amounted to £272,942 against £426,133 in April, 1948. The United States remained the chief supplier of goods and apparatus with £69,584, but this figure was well below last year's (£130,758).

Electron Microscopy Summer School

BY the courtesy of Professor Sir Lawrence Bragg a Summer School in Electron Microscopy will be held again this year in the Cavendish Laboratory, Cambridge.

The School (16th to 27th August inclusive) is intended for those who are already, or in the near future will be, operating it in physical, chemical or biological laboratories. The lectures will deal with the fundamental theory and operating principles of the electron microscope.

A detailed syllabus and form of application for admission may be obtained from G. F. Hickson, M.A., secretary of the Board of Extra-Mural Studies, Stuart House, Cambridge, to whom the completed application form should be returned not later than 11th June.

Industry and the House

Criticism of Nationalized Services

By F. J. ERROLL, M.A., A.M.I.E.E., M.P.

IT is a well-worn Parliamentary tradition that the official Opposition has the right to select the subjects which are to be debated on Supply Days. Thus the Opposition can select the Departments which they wish to criticize on about twenty separate sitting days throughout the year. The custom is to register disapproval of a particular department by proposing a motion that the monies allocated to a Department should be reduced by the sum of £5. When the Opposition decided to debate the Department of the Minister of Fuel and Power they were once more astonished to see the range of nationalized undertakings controlled by Mr. Gaitskell.

In the debate on Thursday last week the Opposition concentrated its attack on the work of the Ministry rather than on the individual nationalized undertakings of coal, electricity supply, and gas. The public may feel that insufficient justice was done to their understandable grievances in the matter of coal quality and coal prices, and electricity charges. These matters are, however, primarily within the jurisdiction of the undertakings themselves and the Minister could only be criticized on fairly general grounds.

Opportunities for Debate

In introducing its nationalization measures the Government has always said that a day would be set aside for the discussion of the annual report of each nationalized undertaking. In fact, this pledge has not been honoured and the Government has been hoping that the Opposition would use up some of their Supply Days for these debates. Instead the Opposition has preferred to exercise its ingenuity in other directions. Quite a large number of Parliamentary questions on the work of the Coal Board and the British Electricity Authority are now appearing on the Order Paper. Furthermore, when the British Transport Commission introduced its first Private Bill earlier this year the Opposition used that occasion to inaugurate a wide-ranging debate on the state of the British Railways. The British Electricity Authority has yet to introduce its first Private Bill and doubtless the Authority's legal advisers are working hard to avoid the necessity for such a Bill which would inevitably lead to a debate on the activities and shortcomings of the Authority.

As it was, the debate on the Ministry of Fuel and Power ranged over the Minister's policy towards the National Coal Board; it included some references to the winter surcharge which has caused so much understandable indignation throughout the country; and the debate also touched on the delicate question of petrol rationing.

Administration of B.E.A.

The view is growing, although it was not expressed during the debate, that the administration of the B.E.A. should be submitted to an impartial examination by outside experts. The National Coal Board gave way to general criticism about its own administration by appointing an internal committee called the Burrows Committee. This Committee never published its full report. Only suitable extracts were made available to the public. The British Electricity Authority could disarm criticism in advance by appointing an outside committee to investigate and report upon its affairs. The timing of such a committee is important. If it starts work too soon its investigations may upset executives trying to settle their departments into a regular routine. If it starts too late the Authority has settled into ways which cannot readily be changed.

The high cost of copper and other non-ferrous metals is rightly becoming a matter of concern to British manufacturers. Repeated complaints about high prices made by foreign buyers at the British Industries Fair have focused attention on to the Government's control of non-ferrous metals. During a period of rising world prices the Ministry of

Supply's prices for copper, lead and zinc tended to lag behind advancing world prices. Now, as the Opposition forecast, the same lag is discernible during a period of falling world prices and manufacturers in this country are having to pay to the Ministry of Supply prices which are many pounds a ton above current and falling world prices. Consequently there is a strong demand for the reopening of the London Metal Exchange and a return to free market conditions. It is significant that the Minister of Supply should have told the House that the reopening of the Exchange is under review. Although he had no statement to make about it at the moment, he nevertheless reduced the prices of the principal non-ferrous metals a few days later.

Despite all attempts by Ministers to avoid questions on nationalized undertakings, the Minister of Fuel and Power is accepting a variety of detailed questions on power supply and even on individual power stations. Thus he promised Mr. Reeves that he would send down an expert from his Department to investigate the emission of grit from Greenwich power station, which belongs to the London Transport Executive. He told Col. Hutchison, Conservative M.P. for Glasgow Central, that it was not yet possible to give the full trading results of those local authorities which had been supplying electricity at a loss at the time of being taken over under the Act. Although he was not in a position to give the information, the fact that he had ascertained the position shows that he is prepared to be more explicit when the information becomes available.

Now that the Monopolies Commission is formed it has become a favourite pastime with Socialist back benchers to suggest additional trades which the Commission should investigate. Mr. Edelman, one of Coventry's two Labour M.P.s, was all for persuading the Minister of Supply to recommend the Commission's investigating the supply of certain types of electrical equipment to the motor industry, which he maintained was almost exclusively in the hands of one firm. To this the Minister would not agree, although he sympathized fully with Mr. Edelman's contention that the high cost of motor components was a severe handicap to our motor exports.

PARLIAMENTARY NEWS

By Our Special Reporter

DURING a debate in the House of Commons on the work of the Ministry of Fuel and Power, Mr. Brendan Bracken, for the Opposition, referred to the position of electricity supply and said that the first act the British Electricity Authority perpetrated when it took over its responsibilities was to raise the price of electricity. That had imposed the harshest of burdens on millions of people, particularly those who lived in all-electric houses. He asked how much electricity had been actually saved by what was called the "Clow differential charge" imposed last winter.

They all knew that the war prevented the building of many much-needed generating stations. They were of the most vital importance to industry. What was the position now? It was a matter for regret that the time taken now to build a big power station was twice as much as it was in pre-war days. The only explanation of that was that there was no drive or efficiency among the many Departments responsible for building new power stations. The British Electricity Authority's administrative machine seemed enormously unwieldy. They were looking forward to getting the first report of that authority in Parliament, and discovering the number of persons employed at what was called the top. In passing he commented on the "unfair methods of trading" adopted by the B.E.A. or its subordinates in the provinces. The Area Boards were now advertising goods on hire-purchase terms, while the Bank of England was requesting or directing the joint stock banks to discourage hire purchase.

Mr. Gaitskell, the Minister of Fuel and Power, in reply, said that the major problem was the shortage of generating plant. There was a sharp increase in the peak demand in 1938 to 1947, and capacity could not be increased during the war to meet that demand. Inevitably the result was that if there was a cold winter there would be a great deal of load shedding. Since then they had attempted to deal with this problem, on a temporary basis, by operating various schemes for load shedding, in which they had had the assist-

ance, and been grateful for it, of both sides of industry.

In regard to the Clow differential, Mr. Gaitskell said that when it was introduced he realized that it would be an unpopular measure, but it would have been an extremely unpopular thing if there had been heavy load shedding last winter and much unemployment as the result. It was impossible to prove how much had been saved by the introduction of the system. He could fairly say that it was probably one of the factors which limited the expansion of demand, and enabled them, with the mild weather, to get through last winter much more easily than they anticipated. He could not prove that it had saved anything, nor could Mr. Bracken prove that it had not saved a great deal.

There never was any intention that the B.E.A. or the Area Boards would gain anything by it. Consumers would pay more at one time in the year and at another they would pay less. It was made clear by the B.E.A. when they announced the scheme that if they made anything out of it the money would go back to the consumers later on.

Plant Capacity and Demand

Turning to the generating programme, Mr. Gaitskell said the facts were that they must expect an increase in demand each year of something like 700 to 800 MW. He was afraid that they would not be able to add on balance to their generating capacity more than that during this coming year. In other words, the additional capacity that they installed this year would probably do no more than take care of the increased demand. It was of great importance now how much a plant was out for breakdown or repair during the winter months, and praise had been given to the B.E.A. for its achievement last winter in this matter, for they reduced the amount of plant out from 15 per cent of capacity that was expected to just over 11 per cent, which made a difference of 400 MW, an extremely valuable contribution. That might be described as a feat of the engineers, but it was a feat which could not have been achieved except under nationalization, because the only way in which it was done was by sending round expert squads from one power station to another. Taking the years 1945, 1946 and 1947 together, the total new plant commissioned was only 800 MW. Last year there was a wonderful achievement with a substantial improvement to 566 MW. He had no doubt that they would do a great deal better than that this year, although he was not making promises or commitments.

It must be remembered that manufacturers were engaged on producing plant for export too. The scale of the programme of the B.E.A. was, nevertheless, very great indeed. There were no fewer than 55 new power stations or extensions to existing power stations being constructed at the moment, and the expenditure this year on plant and buildings alone was something like £115 million which involved half a million tons of steel. It was true that in one or two instances turbo-alternators had gone ahead of building. It was a difficult thing to match precisely every bit of building that was erected with a piece of machinery. It was not a question of planning by the Government; it was a question of taking over the plans of a great many different separate undertakings in the past. It was not at all serious, and the main bottlenecks which affected them now were not building but far more on the boiler-making side than anywhere else.

Mr. R. S. Hudson criticized the Minister for some of his figures. Would he say how far short of the target were the figures for generating stations? For example, the target set for 1940 was 1,150 MW. The actual achievement was 566 MW. The actual programme announced originally for 1949 was 1,600 MW and that was cut in the Economic Survey to 1,000 MW.

Mr. Robens, Parliamentary Secretary to the Ministry of Fuel and Power, said that on vesting date there were 150 electricity undertakings operating at a loss. Their loss for 1948-49 at the figures they were charging would have been between £5 million and £7 million. If the British Electricity Authority on taking control had not put that business right, the Opposition would have said what a poor thing nationalization was because they had lost so much money.

Uganda Hydro-Electric Scheme

The Secretary of State for Foreign Affairs (Mr. Ernest Bevin) announced on 19th May that His Majesty's Government and the Royal Egyptian Government had agreed to the construction of a dam at Owen Falls, Uganda, for the production of hydro-electric power and for the control of the water of the Nile. Plans and specifications had been prepared and approved by the Egyptian Ministry of Public Works and the Uganda authorities.

The two Governments had accordingly agreed to entrust to the Uganda Electricity Board the issue of an invitation for tenders and the placing of contracts, which would be submitted to the two Governments, who would examine them promptly and record their joint approval.

It had also been agreed that, although

the construction of the dam would be the responsibility of the Uganda Electricity Board, the interests of Egypt during the period of construction would be represented at the site by an Egyptian resident engineer of suitable rank, and his staff. The Electricity Board would regulate the discharges to be passed through the dam on the instructions of the Egyptian resident engineer.

During and after the construction of the dam the Uganda Electricity Board might take any action at Owen Falls which it considered desirable, provided it did not entail any prejudice to the interests of Egypt.

Any difference of opinion which might arise in connection with the control of the water or with the generation of power would be a matter for discussion and settlement in a spirit of friendly co-operation. If the authorities concerned were able to settle the matter it would be referred to arbitration.

The Egyptian Government had announced that it would welcome the participation of the Sudan in the projects for the control of the Nile which were now under consideration. The participation of the Sudan would be the subject of technical discussions between Egypt and the Sudan, the results of which would be embodied in agreements to be concluded in connection with these projects.

In due course the peoples of Egypt and the Sudan would derive great material benefits from the Owen Falls scheme, while at the same time hydro-electric power would become available for the development of Uganda and the increase of that country's prosperity.

In reply to a question by Mr. Scollan, Mr. Bevin said that the Egyptian Parliament had voted £E4,500,000, part of which would be paid in compensation for disturbance of the peoples affected. It would cost the Uganda Government about £7,500,000, he believed, as a preliminary payment. But when a great project such as this was started it led to enormous investment for future development.

Telephone Charges

Speaking in a debate on the Post Office Vote last Monday, Captain Crookshank said that the Post Office accounts for 1947-48 showed an operating profit on telephones, after allowing for capital charges, of £10¼ millions, yet charges were to be increased. Was it the policy of the Postmaster-General to deter people using the service, or was he after the money?

Mr. E. Davies considered the decision to increase the charges wrong in principle. If the reason was to prevent further expansion, it constituted a tax on consumer use. If it was to bring more money to the Treasury, it was a principle of milking a nationalized industry at the expense of the consumer—a retrogressive step.

Mr. Hopkin Morris thought some of the profits should be used to improve telephone services in rural areas.

Mr. F. Harris said that the increased charges were putting up the cost of living and increasing the costs of manufacture. The authorities should have considered a reduction.

The Postmaster-General (Mr. W. Paling), in reply, said that the charges made during the debate had more to do with the Chancellor of the Exchequer than with himself. In the accounts for the year just ended the profit would be down to £6 million and for the year which had just started it would probably be £3 million. It was too early to say whether the new charges would affect the demand, but so far there was no sign of this. Regarding development, they had worked out a new scheme for rural kiosks.

Regarding rentals, so far as the increase in the direct charge for use of the telephone was concerned it had been decided that it would be better to deal with this matter by administrative action than by legislation. It would not be possible to make the new charge effective before 1st January next at the earliest. This would reduce the contribution to the current year's revenue from the £1 million estimated to about £400,000. In view of the reduced yield the Chancellor was looking into the matter again to see whether it would be possible to obviate this change in the contractual relationship at the present time.

The motion to reduce the Vote moved by Captain Crookshank was negatived by 196 votes to 118.

Glass Buyers' Guide

THE second edition of the "Glass Buyers' Guide," published by the Du Mont Publishing Co., Ltd., 123, Pall Mall, London, S.W.1, to coincide with the British Industries Fair, contains useful information, particularly to overseas buyers, of the sources of supplies of British glass and glassware. Included in the information given is a list of members of the Glass Manufacturers' Association, including a number of electrical companies and also a list of the companies forming the Electric Light Fittings Export Group. Copies of the guide can be obtained from the publishers at 3s 6d each for single copies or 3s each for twelve or more.

NEW BOOKS

Elementary Theory—Mathematics—Illuminating Engineering

Basic Technical Electricity. By H. Cotton, D.Sc., M.I.E.E. Pp. 238; figs. 74; illus. 6; index. Cleaver-Hume Press, Ltd., 42a, South Audley Street, London, W.1. Price 8s 6d.

This is a very readable and admirably illustrated book on the elementary theory of electricity and magnetism intended for those with no previous knowledge of the subject. It covers simple d.c. theory, the chemical and heating effects of a current, electro-magnetism, electromagnetic induction and electrostatics, together with two short chapters on measurements and units. The mathematics is very simple, the quantitative side of the subject is illustrated by a number of fully worked examples, and there is a good selection of exercises.

The author might well have been a little more rigorous in dealing with fundamental ideas. It is doubtful whether the chapter on units will be quite clear unless the student understands the dynamical units on which they are based, and the meaning of the gravitational constant introduced without explanation on page 212. Again, the enunciation of Ohm's law seems imperfect. The essence of the law is the constancy of resistance with constant circuit temperature. Even elementary students ought to be told that this is not an inherent and essential property of an electrical circuit, as seems to be implied on page 26, but that it is an empirical generalization which is not universally true. These, however, are quite minor criticisms.

Generally, Dr. Cotton's book can be thoroughly recommended, and those who work conscientiously through it, solving the problems set in the appendix, will have laid a good foundation for further and more advanced study.—G. W. S.

Mathematics for Electricians. By M. M. Kuehn. Third edition. Pp. 372; figs. 116; index and answers to problems. McGraw-Hill Publishing Co., Ltd., Aldwych House, Aldwych, London, W.C.2. Price 17s in U.K.

Here is a somewhat unfamiliar kind of book the contents of which may be described as a mixture of elementary mathematics and elementary electrical theory. The several sections on mathematics are each followed by chapters on electricity, in which mathematical principles and technique are illustrated. Thus, algebraic manipulation and simple equations are followed by d.c. circuit theory; algebraic multiplication by electrical power; simultaneous equations by Kirchhoff's laws; elementary trigonometry by a superficial sketch of a.c. theory; and vector algebra by a.c. parallel circuits. By this arrangement the student is made to realize very clearly the practical utility of his mathematical work.

The chapters on the more elementary parts of mathematics are generally quite good and useful but, while those on logarithms and complex quantities may impart some facility in a mechanical technique, they will not do much more. The utility of an explanation of vector algebra is doubtful unless the fundamental convention for vector multiplication is clearly explained. The application of mathematics to a.c. problems is the least successful part of the book. Otherwise it merits commendation. There are many exercises for solution, with the answers, and a useful appendix gives tables of five-figure logarithms of numbers and trigonometrical ratios of minutes of angles.

The book will probably be of most use to electrical apprentices of limited school education who have to obtain their theoretical knowledge mainly by private study.—G. W. S.

An Introduction to the Science of Artificial Lighting. By R. O. Ackerley, M.I.E.E., F.I.E.S. Pp. 135; figs 41 and 32 plates; index. E. & F. N. Spon, 57, Haymarket, London, S.W.1. Price 12s 6d.

The author of this book is well-known as a skilful exponent of the practice of illuminating engineering and he has here set out to explain the underlying principles to all those who, like the architect, are professionally concerned with lighting but whose knowledge of the subject must necessarily be severely limited. To say that Mr. Ackerley has succeeded in doing this would be an under-statement, for his book should provide a valuable introduction to lighting for many an engineer whose interest in the subject is more personal than professional.

Some of the material has been drawn from the author's paper read before the Installations Section of the Institution of Electrical Engineers four years ago. In particular, his rather terrifying analytical diagram of "the lighting problem" is reproduced and the wisdom of including this in a book intended for the inexpert is perhaps open to question. Far more valuable is the really fine collection of plates showing examples of good lighting design and demonstrating the way in which illuminat-

ing engineering at its best can serve the community. The book can be strongly recommended to all who are interested in lighting and who want to learn enough of the technical basis to enable them to appraise intelligently and with discrimination the work of the professional lighting engineer.—J. W. T. W.

Rayonnement, Photométrie et Eclairage. By Merry Cohu, D. és-Sc. Pp. 398; figs. 299; index. Gauthier-Villars, 55 Quai des Grands-Augustins, Paris. Price 1700Fr.

In spite of its title (Radiation, Photometry and Illumination), this is a textbook for the lighting engineer. Radiation is dealt with mainly from the point of view of light production, the first third of the book, apart from a few introductory pages, being devoted to a description of the construction and operating characteristics of the principal sources of light. The middle third is a treatise on photometry, while the remainder of the book deals with the theory and practice of illuminating engineering.

On the whole the photometric section is probably the least successful, since much of the necessarily limited space is occupied by descriptions of obsolete and obsolescent apparatus. The section on light sources is very well-balanced, considerably more than half being concerned with the electric discharge through gases and its application to light production. The illumination section covers a very wide field with varying success, more than half the space available being taken up with descriptions of outdoor lighting, its design, testing, methods of control, etc.

The book is a useful addition to French literature on illuminating engineering and it is therefore to be regretted that the publishers could not achieve a higher standard of production.—J. W. T. W.

Coal, Production, Distribution, Utilization. Edited by P. C. Pope. Pp. 236; figrs. 90; index. Industrial Newspapers, Ltd., 49, Wellington Street, London, W.C.2. Price 12s 6d.

In this joint publication of the Coal Industry Society and the Institute of Fuel the processes involved from the getting of the coal in the mine to steam raising and to its domestic use as solid fuel or as electricity or gas are lucidly explained. Its appeal will be to all interested in the production and methods of distribution and burning of coal, whether professionally, commercially or as members of the public wishing to learn essential particulars of our greatest national asset, which is also the raw material of electricity supplied from the public mains.

The reason for regarding coal as a generic term that includes many widely different species—all with their own spheres of usefulness—will be apparent from the well-written accounts of its formation, composition, classification and analysis and of the characteristics of the various coal fields of Great Britain. The importance of clear discrimination here was implicit in the remarks of the Minister of Fuel at the recent E.D.A. annual luncheon on the use of relatively plentiful low-grade fuels for the generation of electricity. The section on mining gives information on the increase in the consumption of electricity that would result from complete mechanization, and it is noted that the average amount of air passing through modern workings is about five times the weight of coal produced. It is also shown that recent improvements in coal preparation technique enable better and more consistent qualities of coal to be obtained with considerable reduction of waste. Other aspects dealt with are carbonization and gasification (including the limited prospects of underground gasification) and the extraction of oils and chemicals.—C. O. B.

The Home Workshop. Odhams Press, Ltd., Long Acre, London, W.C.2. Pp. 384; figs. 900. Price 8s. 6d.

This book is intended for all those who find their relaxation in making and mending articles in the home. It is divided into sixteen sections and covers all those things which the most ambitious owner of a workshop would desire to possess or to repair. —R. P.

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COMMERCE and INDUSTRY

Management Institutes Merge : Large Argentine Contracts

AN agreement designed to bring about a merger between the British Institute of Management and the Institute of Industrial Administration by two stages has just been signed. During the first stage which comes into effect immediately, the Institute of Industrial Administration will retain its separate identity and its professional activities will continue unchanged, but its executive management, subject to the policy control of its own Council, will be undertaken by the staff of the British Institute of Management.

The merger will be completed in the second stage which is expected to come into effect in two or three years' time. Meanwhile, the British Institute of Management will encourage managers desiring professional qualifications in management to join the Institute of Industrial Administration.

The signing ceremony took place at 17, Hill Street, W.1, the temporary headquarters of the British Institute of Management, the principal signatories being Sir Charles Renold, chairman of the British Institute of Management, and Lord Forrester, president of the Institute of Industrial Administration. It was followed by a luncheon party given by Sir Harold West, vice-president of the Institute of Industrial Administration.

Electrical Machinery Production and Exports

Statistics appearing in the *Monthly Digest of Statistics* show that during 1948 the aggregate capacity of steam turbo-generators of 10,000 kW or over produced in this country was 1,343.5 MW. Of these sets of a total capacity of 4.68.5 MW were exported. The production of steam turbines of less than 10,000 kW is given as 297.3 MW (218.9 MW exported). Hydraulic turbines aggregating 76,500 b.h.p. were manufactured; of these 50,000 b.h.p. were exported.

A.c. motors between 1 and 250 h.p., kVA or kW were valued at £13,690,000, including exports of £2,433,000. The aggregate value of production of other motors was £6,887,000 and the value of exports £1,295,000. Fractional h.p. motors, valued at £7,407,000, were produced; the exported portion had a value of £1,310,000.

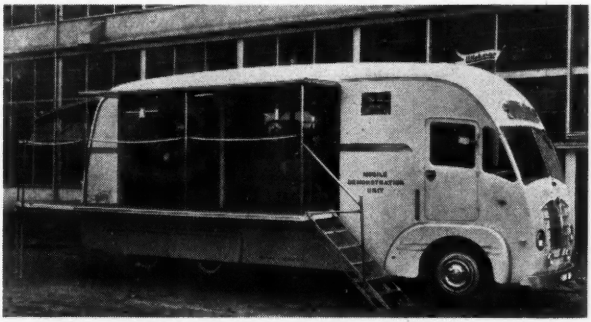
Production of electrical control gear is given as £11,935,000, including exported equipment valued at £2,056,000.

Contractors at Royal Show

It is announced that the National Electrical Contractors' Trading Association, Ltd. (N.E.C.T.A.), in conjunction with the Electrical Contractors' Association, has taken a stand at the Royal Show to be held at Shrewsbury from 5th to 8th July. The exhibit will demonstrate the wide scope of services offered to farmers by electrical contractors and retailers. A large number of well-known manufacturers are co-operating with the N.E.C.T.A., and there will be on show a considerable range of agricultural and horticultural electrical equipment.

Mobile Demonstration Unit

The overseas demand for machine tools has steadily grown since the war, but competition is also increasing. To maintain and improve their position in overseas markets A. C. Wickman, Ltd., machine tool makers, of Coventry, have launched a mobile demonstration unit which was shipped at Dover on 2nd May and arrived at Ventimiglia, Italy, on 10th May, for a tour of the Northern Italy industrial regions. Later it will tour Switzerland, France, Scandinavia and Spain.



Wickman mobile unit prepared for demonstration

The vehicle, which has been designed by

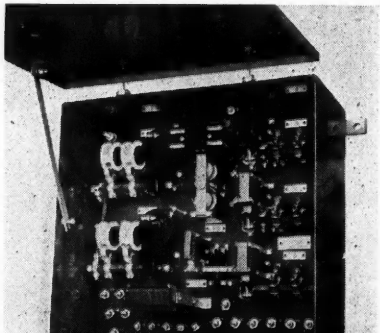
the company's engineers, is completely self-contained, generating its own power to run the three heavy machines which the vehicle is carrying, and stocked with sufficient supplies of raw material to enable the unit to operate away from bases for over two months. Concealed outriggers are drawn out from the body to support the lower halves of the side panels and the rear panel, which hinge down to form a promenade surrounding the unit on three sides. The upper halves of the side panels are raised outward and, supported by light alloy tubular stanchions, form a canopy to the promenade. Aluminium stairways secured to the front ends of the promenade are then swung out, complete with handrail.

Contract Price Adjustment Formulæ

The following are the latest figures for use in the B.E.A.M.A. contract price adjustment formulæ:—The rate of pay for adult male labour at 14th May is deemed to be 115s. Cost of material: the Board of Trade index figure for intermediate products at 14th May is 259.9 and is the figure for April.

Control Gear for Rio de Janeiro

The British Thomson-Houston Co., Ltd., is providing the complete electrical control equipment for twenty cranes being supplied by Stothert and Pitt, Ltd., for installation



B.T.H. crane control panel

at Rio de Janeiro, in South America. The accompanying illustration shows one of the automatic control panels for three 10-ton cranes which form part of the order. This panel, which is of B.T.H. patented design, operates in conjunction with a separate master controller and resistance; it controls the 18 h.p. a.c. motor for the luffing motion of the cranes. Although contactor gear is provided for the luffing motion, the acceleration is under the control of the operator. Upon reversing, however, it is impossible to exceed a predetermined value of braking torque; should the master controller be moved too rapidly, the braking torque is limited to a safe value by a relay.

Cable Research at Torquay Convention

One of the papers at the British Electrical Power Convention (Torquay, 13th-17th June) will be presented by Mr. T. R. Scott, D.F.C., B.Sc., M.I.E.E., on behalf of the Cable Makers' Association. In connection with this the C.M.A. is arranging at the South Devon Technical College, Torquay, a demonstration of apparatus used in cable research laboratories.

E.A.W. Convention Luncheon

In announcing arrangements for its luncheon on 16th June during the British Electrical Power Convention at Torquay, the Electrical Association for Women says that the speakers will include Lord Citrine, president of the Convention, and Mrs. A. B. Lewis, J.P., chairman of the E.A.W. The Dowager Lady Swaythling (president) will take the chair.

Allocation of Electrical Work

Having discussed with the secretary of the Beds and Herts Branch of the Electrical Contractors' Association the allocation of electrical sub-contracting work in respect of 378 houses on the Farley Hill estate, the Luton borough engineer has recommended that sub-contracts should be allocated as follows:—Woodcraft Electrical (Luton), Ltd. (52 houses, £2,520); Williams & Richardson (56 houses, £2,742); T. N. Park (54 houses, £2,586); H. A. Cawdell (56 houses, £2,793); R. J. Stearn & Sons (Luton), Ltd. (56 houses, £2,725); H. F. Scriven (52 houses, £2,524); and J. E. Burrows (52 houses, £2,573).

Leicester Trades Exhibition

On 19th May the Duke of Gloucester opened the Leicester and Leicestershire Industries Exhibition and Trade Fair in the Granby Halls, Leicester. The Duke said he was encouraged to see, apart from the important hosiery, textile, shoe and leather trades traditionally associated with Leicestershire, how wide and varied was the range of firms represented at the exhibition. It was interesting to know how remarkable an increase there has been in the number of firms in the city and county engaged in all forms of light engineering. The exhibition would give young people an insight

into the careers open to them in local industry, and show something of our public service. Among the many firms exhibiting were the Midland Dynamo Co., Ltd.; Electrical Equipment Co. (Leicester). Ltd.; Communications Systems, Ltd.; Electraire Productions, Ltd.; and Western Engineering Co.

Vacuum Cleaner Poll

As reported last week, refrigerators were presented on 17th May to the winners of a

Major-General Sir Harold Wernher presenting a refrigerator to Mrs. C. E. Chaplin, winner of the Electrolux vacuum cleaner poll

national poll organized by Electrolux Ltd., to discover the most-sought-after qualities of a vacuum cleaner. The accompanying picture shows the chairman of the company, Major-General Sir Harold Wernher congratulating Mrs. C. E. Chaplin, winner of the first prize.

Switchgear for Parliament

Circuit breakers mounted on the series of switchboards being installed in the Houses of Parliament by Dorman & Smith, Ltd., are of the air-break type. The breakers are hand operated and range up to 2,000 A. They are of the draw-out type and tests at 25 MVA were specified and carried out at 440 V. After drawing out, the breakers can be swung down 90 deg to allow for easy inspection.

The interlocks are comprehensive; the breakers cannot be drawn out or pushed in if the circuit breaker is closed, but the cubicle can be closed with breaker isolated. An indicator for "On," "Off," "Isolated" is provided. Driving and tripping spindles are insulated where they pass from pole to pole and the mechanism of each pole is insulated from the others. Arc chutes are readily removable for inspection of main and auxiliary contacts, which are all easily renewable by the maintenance staff. The necessity for such renewal is, however, a remote contingency under normal conditions of operation. If air-break circuit breakers are not inspected periodically the neglect will only result in a somewhat higher cost of replacement of worn parts, but in the case of oil-immersed breakers such neglect may have serious consequences.

Forged Reference

The *Evening News* reports that at Bow Street Police Court on 20th May, G. D. Boyd-Carpenter (42) was fined £15 (or two months' imprisonment in default of payment), with £5 costs, after pleading guilty to a summons under the Servants' Character Act, 1792. It was stated by a police witness that by means of a forged certificate of character the defendant had obtained the appointment of secretary to the British Refrigeration Association at a salary of £1,000 a year in competition with 200 other applicants.

British Railways Programme

Building programmes of the British Railways for 1949 were announced by the Railway Executive on 18th May. These include the construction of 1,972 coaching vehicles, of which 1,685 will be passenger vehicles. Of these the non-corridor coaches will include 500 electric vehicles, of which 276 will be for the Liverpool Street-Shenfield line, 24 for the Manchester area suburban service of the Sheffield-Manchester line, and 200 for the Southern Region suburban services. Locomotive construction includes fifteen 350 h.p. diesel electric locomotives, two main line diesel electric locomotives, one diesel electric shunter and one gas turbine locomotive.

Liverpool Illuminating Engineers

Lord Woolton was the principal guest and speaker at a luncheon meeting of the Liverpool Centre of the Illuminating Engineering Society on 17th May. Mr. J. M. Waldram (president, I.E.S.) was also present. Mr. O. C. Waygood, who presided, referred to the relaxation of lighting restrictions on shop window and street lighting. That relief, he hoped, could be carried through next winter.

Lord Woolton said he had occupied a certain amount of his time in trying to illuminate human understanding. Eventually, he believed, we should regain our prosperity, but in the immediate future he feared the country was in for troubled times. There were far too many people telling others what to do, and too few with the practical experience of the operations

on which they gave directions. Within the last fortnight they had had the experience of buyers who had come to this country from overseas, saying they liked our goods and admired our craftsmanship, but found them too dear. High rates of wages were consistent with low costs of production if people would only work for the wages they received.

Commercial Electrical Travellers

The Electrical Trades' Commercial Travellers' Association is holding a general meeting to-day (Friday), at 5 p.m., at the Feathers Hotel, Broadway, London, S.W.1.

New Formby Showroom

The Merseyside and North Wales Electricity Board has opened a new showroom and demonstration theatre at Formby. Mr. J. Eccles (chairman of the Board) stated at the opening ceremony that it would be in the domestic consumers' interests to use electricity freely during the summer months when the prices were low and so save coal for the winter.

Large Argentine Contracts

In our last issue we briefly reported that the Harland Engineering Co., Ltd., had obtained an order for electric pumping installations for the water supply of Buenos Aires. The company has now sent us some particulars of the plant to be supplied. The value of the order is £750,000 and it is the second received by the company for the Buenos Aires water supply reconstruction scheme, bringing the total value to nearly £1,000,000. The orders were secured in face of heavy international competition. The first contract received last year was for the major plant for one of four stations to be constructed, and the latest order is for the remaining three.

The scheme developed by the Argentine Obras Sanitarias for the provision of water to Buenos Aires is both comprehensive and modern, and when completed will result in one of the finest waterworks installations in the world. The water supply is to be taken from the River Plate at Palermo, and there filtered and treated before passing by a large concrete-lined tunnel under the city of Buenos Aires to strategic points where the new pumping stations are located for lifting and discharging the water into supply.

The four stations, at Cabillito, Villa Devoto, Cordoba and Constitucion, will be equipped with six, six, five and six pumps of the borehole type respectively with one unit in each case acting as stand-by. The pumps incorporate a number of pump stages of the Harland "Spyrobowl" design, suspended in the tunnel and shaft driven by Harland motors situated at ground level. The motor horsepower for the entire scheme will total nearly 32,000 and the combined output of the twenty-three pumps over 500 million gallons per day. The contract includes delivery, installation, setting to work and various auxiliary equipment for the station.

Canadian Electric Motor Order

Crompton Parkinson, Ltd., have received from Canada a $100,000 (£25,000) order for 1,775 electric motors. The order was obtained by the company's Canadian agents, Bepco Canada, Ltd., Montreal, from the Hydro-Electric Power Commission of Ontario. The motors are being manufactured at the company's works at Guiseley and Doncaster. The importance of the order as a means of bringing dollars to Britain was emphasized to the employees and they are co-operating to make the extra effort needed to ensure that the complete order is despatched by the end of August, the time specified. Part of the order has already been despatched.

South African Import Restrictions

The Capetown Correspondent of *The Times* reports that Dr. Dönges, Acting Minister of Economic Affairs, has announced what amounts to a total ban on imports of finished consumer goods from sterling countries as well as America, in the second half of the year. The only exceptions will be goods shipped from Britain by 13th June and goods ordered in conformity with the exchange control regulations from the dollar area before 30th June. Dr. Dönges stated that South Africa had insufficient exchange for the rest of the year—both in sterling and dollars—to finance imports of raw materials for industry and necessary capital goods. The Government hoped that the position would be improved by 1950, but meanwhile imports would be limited to essential raw materials and essential capital goods for industry, mining and agriculture. Preliminary permits for the importation of these goods would be issued on the basis of one quarter of last year's imports from the sterling area and one-sixth of last year's imports from the dollar area.

Industrial Safety Conference

Nearly 450 delegates attended this year's National Industrial Safety Conference, held at Scarborough, from 13th to 15th May. The conference was organized by the Royal Society for the Prevention of Accidents, and the chairman was Mr. R. R. Hunter, welfare officer of Vauxhall Motors, Ltd. In addition to delegates from almost all industries, those present included Mr. G. P. Barnett, H.M. Chief Inspector of

Factories and Mr. J. I. Hamilton, H.M. Chief Inspector of Factories for Northern Ireland. Lord Llewellin, president of the Society, welcomed the delegates on the opening night, and among the speakers during the conference was Mr. G. W. Clarke, of Standard Telephones and Cables, Ltd., who spoke on "The Engineer and Safety." Next year's conference will again be held at Scarborough from 12th to 14th May.

Registered Electrical Contractors

The annual general meeting of the National Register of Electrical Installation Contractors will be held on Monday next at the Institution of Electrical Engineers, Savoy Place, London, W.C.2, at 2.30 p.m.

Trade Announcements

The address of the Scottish branch of the **Jackson Electric Stove Co., Ltd.,** is now 104, West Campbell Street, Glasgow, C.2. (tel. Central 3796). In the new premises there will be a showroom for the display of cookers and other appliances and a Service Department. Mr. H. MacKenzie is the Scottish branch manager. Mr. A. Jackson, previously with the Simplex Electric Co., Ltd., has joined the Liverpool Branch of the Jackson Electric Stove Co.

Bound Brook Bearings (G.B.), Ltd., is transferring its head office and works on 1st June from Birmingham to Trent Valley Trading Estate, Trent Valley Road, Lichfield, Staffs (telephone: Lichfield 2027).

Mr. D. Hann has now taken over the whole of Derbyshire on behalf of **Wheeler Electrical Supplies (Wholesale), Ltd.,** of 59, Osmaston Road, Derby. Mr. G. T. Shufflebotham, of "Sandon," Park Drive, Barlaston, Stoke-on-Trent, will represent the company in North Staffs and the Potteries, and Mr. T. M. Leigh will in future cover Beeston, Stapleford and Nottinghamshire.

Young & Wildsmith, Ltd., announce that their head office and Ilford branch will be closed on Saturdays from 4th June. The Luton branch will be open on Saturdays.

Mr. A. J. Catlin, 27, Amberley Gardens, Ewell, Surrey, has been appointed sales representative for the **Truvox Engineering Co., Ltd.,** for South London, Surrey, Kent, Hants, Isle of Wight and Sussex. Mr. P. J. Kelsey, 82, Slatch House Road, Smethwick, Birmingham, will cover Shropshire, Staffs, Leicester, Rutland, Hereford, Worcester, Warwick, Northants, Peterborough and Derbyshire. Mr. L. N. W. Morrell, 68, Brantwood Avenue, Monkseaton, Northumberland, has accepted an agency for the sale of Truvox domestic appliances and radio speakers. He will cover Cumberland, Westmorland, Durham, Northumberland, Middlesbrough and the Barrow Peninsula. R. S. McGibbon & Co., 92, Union Street, Glasgow, C.1, have accepted an agency for Scotland, and Mr. A. M. Everett, 70, East End Avenue, Warminster, Wiltshire, for Cornwall, Devon, Dorset, Somerset, Wiltshire and Gloucester.

Fatal Accident at Pitlochry

While preparing to blast 400 tons of rock a mile and a half inside a hydro-electric tunnel near Pitlochry, Perthshire, one man was killed and sixteen others injured by lightning detonating five explosive charges. The flash struck the plunger apparatus at the mouth of the tunnel and short-circuited the wires.

Machine Tool Driving Unit

Smith Bros. & Webb, Ltd., Vulcan Works, Stratford Road, Sparkbrook, Birmingham, 11, point out that they are manufacturers of the "Powalastik" machine tool driving unit shown on the stand of Newman Industries, Ltd., at the British Industries Fair and illustrated and described on pages 766 and 767 of our 6th May issue.

Catalogues and Lists

Coleman & Appleby, Ltd., Constitution Hill, Birmingham, 19. — Catalogue of "Canda" barrel plating equipments.

Hellermann Electric., Ltd., Tinsley Lane, Crawley, Sussex.—Folder (No. N.L.1), on "Helatex" waterproof sleeves for cable junctions.

Sun Electrical Co., Ltd., 118-124, Charing Cross Road, London, W.C.2.—Monthly stock list of electrically operated tools and motors.

British Thermostat Co., Ltd., Windmill Road, Sunbury-on-Thames, Middlesex. — Two leaflets on "Teddington" refrigeration thermostats, types QJ and QR for domestic and commercial applications respectively.

James Neill & Co. (Sheffield), Ltd., Composite Works, Sheffield, 11.—Four leaflets on "Eclipse" fretsaw frames, spiral piercing saw blades, vee vices and instrument vices.

Metway Electrical Industries, Ltd., King Street, Brighton, 1, Sussex.—Priced catalogue (No. MYH/1) of elements and spirals for domestic appliances.

Venner Time Switches, Ltd., Kingston By-Pass Road, New Malden, Surrey.—Priced leaflet on time switches for use in poultry houses.

Edison Swan Electric Co., Ltd., 155, Charing Cross Road, London, W.C.2.—Priced folder on fluorescent lamps, fittings and accessories.

Poole Generating Station

SPEECHES AT LAST WEEK'S CEREMONY

ADVANCE particulars of the 200 MW power station at Poole were given in the *Electrical Review* of 20th May. Erection of the steel frames of the buildings is proceeding rapidly and of the plant two boiler drums are already on site. In laying the foundation stone, which formed part of the first brickwork (all of local clay) to be completed, the Mayor of Poole, Alderman S. F. Langridge, referred to the desirable publicity to be obtained from the fleet of colliers, each having "Poole" as part of its name and to the other advantages the installation would bring to the district. He paid a tribute to the contractors and others responsible.

Sir Henry Self (left) and Mr. R. H. Coates inspect the Poole foundation stone

Previously, Mr. C. W. Priest (of the B.E.A. Southern Division) had referred to the occasion as marking the 700th anniversary of Poole's municipal charter. Mr. R. H. Coates (divisional controller) mentioned that the 150,000 ton block of concrete of the plant foundations had about the same bulk as the shingle used 2,000 years ago by the Romans to build an eight-mile road from Hamworthy Peninsula to Bradbury Rings. Apart from personal needs, what was most urgently required to help national production was more electric power, since the essence of civilization was electricity.

Sir Henry Self (deputy-chairman, B.E.A.) said that the station (which was contemplated in 1938 but had been held up by the war) was due to the foresight of Sir John Dalton and Mr. W. J. H. Wood, of the County of London Company. He hoped the station would start operating next year and would be complete in 1951. One of the biggest difficulties would be housing the operatives. The loss in rates to the locality under nationalization (to which the Mayor had referred) was a question of allocation by the Ministry of Health, to which last year the B.E.A. paid £12 million. Two years ago plant capacity was short of demand by 2 million kW, but the B.E.A. four-year programme for a 40 per cent expansion (in 38 stations), costing £400 million, should close the gap in 1953, after which by building five new stations every year capacity would keep pace with demand. This year one million kW was expected to be brought into service and would thus be the first post-war year in which new capacity would exceed growth of load. For the present it would be necessary to avoid using electricity during peak hours, but at other times to use it in preference to household coal.

E.I.B.A. Golf Championship

SCORE cards are again available to golfers in the electrical industry for competition in the Electrical Industries Benevolent Association national golf championship for 1949. The championship is open to any male golfer who has a handicap of 24 or less on any course with a minimum length of 5,000 yd. Entrants will play off preliminary rounds on their own course, using score cards provided by area secretaries at 2s 6d per card. The winners of each area trophy, together with the runner-up and the best scratch score competitor, are entitled to compete in the national championship which will again be held at Moor Park in early October. Inquiries should be addressed either to the local E.I.B.A. Committee or to the hon. secretary for the golf championship, Mr. A. H. Hughes, 21, Bloomsbury Street, London, W.C.1.

FINANCIAL SECTION

Company News
Stock Exchange Activities

Reports and Dividends

International Combustion, Ltd.—In the course of his speech at the annual meeting held on 18th May, Mr. G. R. T. Taylor (chairman) said that there was a further substantial increase in the value of orders booked during the year under review, including an expansion of export work, the balance of work on hand at the end of the year reaching a new high peak. It should be possible at least to maintain the present rate of output for some time. In order to increase their output further the directors had authorized the construction of engineering works by each of the company's subsidiaries in Australia and South Africa, which would help to relieve the pressure on their Derby works by manufacturing locally certain of the supplies required for contracts in those countries.

The Telegraph Construction and Maintenance Co., Ltd.—The annual meeting was held on 17th May, Lord Colgrain (chairman), presiding. In his circulated statement the chairman says that during the year under review all departments have been fully employed, resulting in an appreciable increase in total production over 1947. A great deal of important research and experimental work has also been done, more especally in the communication cables field and in their metallurgical products.

The new Anglo-Dutch submarine telephone cable laid at the end of 1947, which was manufactured by their associated company, Submarine Cables, Ltd., owned by them jointly with Siemens Bros. & Co., Ltd., has proved a great success, and a further similar cable was manufactured and laid during the year under review between this country and Belgium. During the year they have commenced the manufacture of another submarine telephone cable, between Holland and Denmark, which they expect to lay during 1950.

Their subsidiary, the Selborne Plantation Co., in Malaya, has enjoyed a year of considerable prosperity, and output during the year was well above the anticipated figure.

A. Reyrolle & Co., Ltd.—Presiding at the annual meeting held on 12th May, Sir Claud D. Gibb said that between 1946 (the first post-war year devoted to normal products) and 1948, the number of employees increased by less than 5 per cent, but the physical output expanded by more than one-third, the increased output being achieved by simplification of office and works organization and planning, improved equipment, better layout, and a higher standard of machining accuracy.

The consolidated gross profit on the past year's trading was more than twice that for 1947, due to the fact that the output exceeded the substantially higher target which had been planned for 1948. Extensions to the research laboratories were in hand and were nearing completion. To meet the increasing demands for high-voltage switchgear, a new and very high shop was being erected at Hebburn works and should be in operation by the end of 1949. The 1948 output should at least be repeated in the current year. It must be recorded, however, that competition—particularly in the overseas market—was increasing, and in these circumstances margins might well be reduced.

C. A. Parsons & Co., Ltd.—The main figures of the report and accounts were given in our issue of 13th May. In his circulated statement, Sir Claude Gibb (chairman and managing director) says that the current year is the diamond jubilee of the Heaton Works, which now cover forty-two acres and employ 4,700 people. The year 1948 was one of record output and it is anticipated that 1949 will be another year of record production. Over 50 per cent of the total output in 1948 was exported, Canadian sales alone amounting to approximately $1\frac{1}{2}$ million. Plant replacement costs to-day are so high that it is impossible to maintain the desirable degree of retooling, unless the present crippling level of taxation is considerably reduced or selling prices are increased. Export markets for heavy electrical plant will be closed to British manufacturers if selling prices are further increased and may shortly be lost unless there is a reduction in price. Their outlay on new equipment and extensions during the past three years has amounted to £1,500,457.

Vent-Axia, Ltd., reports a profit for the year ended 31st March last, subject to audit, of £70,040, as compared with £62,039 for 1947-48. Taxation absorbs £39,287 and expenses of share marketing £2,407. General reserve receives £11,678, and it is proposed to pay a final dividend of 150 per cent again making 250 per cent, less tax, for the year. It is proposed to capitalize £45,000 of reserves and distribute it by way of capital bonus in the proportion of three new shares for each one held.

R. B. Pullin, Ltd., report a consolidated trading profit for the year to 30th September last of £8,330, and after providing for taxation of £16,330, and other small items, there is a deficiency of £8,291, which in-

creases the debit carried forward to £60,828. The parent company's trading profit, after depreciation, etc., is £32,925, as compared with £13,784 for the previous year, plus rent of £1,500 and profit on sale of fixed assets of £1,147, making £35,572. Taxation requires £14,628, leaving a net profit of £20,944. The dividend for the year is unchanged at 10 per cent and £16,996 is carried forward (against £1,552 brought in).

The Telephone & General Trust, Ltd.—Particulars were advertised on Friday last, for information only, of an issue of £400,000 3½ per cent first debenture stock, 1957-72, which is being subscribed at 100¾ and placed by Norris Oakley Brothers. The purpose of the issue is to reduce bank indebtedness.

The Rheostatic Co., Ltd., reports a net profit for the year to 30th September last of £38,631, as compared with £25,172 for the preceding year. The final ordinary dividend is 14 per cent, again making 20 per cent for the year.

Hall Telephone Accessories, Ltd., report a trading profit for 1948 of £79,077, as compared with £52,858 for the preceding year and a net profit of £55,465 (against £28,537), plus tax over-provision of £5,125, price adjustments on Government contracts, £13,123, and a balance of £26,653 brought in, making £100,366. After providing for taxation, investment reserve, etc., it is again proposed to pay a dividend of 10 per cent, leaving £25,893 to be carried forward.

Siemens Brothers & Co., Ltd., in a preliminary statement, report a net profit for 1948, after providing for taxation, of £418,498, as compared with £344,751 for 1947. The ordinary dividend for the year is unchanged at 7½ per cent.

Veritys, Ltd., report a net profit of £13,689 for 1948 (against £21,725 for 1947). The ordinary dividend for the year is unchanged at 5 per cent.

The Southern Areas Electric Corporation, Ltd., reports a net profit for 1948 of £36,602, as compared with £27,483 for 1947. The ordinary dividend for the year is maintained at 5½ per cent.

Allen West & Co., Ltd., reports a consolidated net trading profit for the year ended 31st January last of £243,582, as compared with £111,588 for the preceding year. The dividend on the ordinary stock for the year is 7½ per cent, plus a bonus of 2½ per cent (unchanged).

Marco Refrigerators, Ltd., have declared an unchanged interim ordinary dividend of 12½ per cent, less tax.

Turner & Newall, Ltd., are again paying an interim ordinary dividend of 3¾ per cent.

New Companies

Asq-Kay & Co., Ltd.—Registered 14th May. Capital £4,000. Manufacturers of and dealers in boilers, turbines, winding engines, haulage plant, dynamos, motors, electrical plant and equipment, motor vehicles, etc. Directors: V. Asquith and J. L. Kay. Regd. office: 27, Kingswood Avenue, High Jesmond, Newcastle-on-Tyne.

Shearstone, Peters & Dunn, Ltd.—Registered 13th May. Capital £7,500. Electrical, constructional, radio, electro-medical, electronic and general engineers, etc. Directors: J. Shearstone and J. E. Peters. Regd. office: 75, Arundel St., Sheffield, 1.

Craneswater Products Co., Ltd.—Registered 14th May. Capital £100 Manufacturers of and dealers in electrical appliances, apparatus and fittings, etc. Directors: J. F. R. Mills and Mrs. Dorothy M. Mills. Regd. office: 3, Kneller Gardens, Isleworth, Mdx.

R.O.B. Electrical Co., Ltd.—Registered 7th May. Capital £1,000. Subscribers: M. C. George and Lilian Carmichael. Regd. office: Bristol House, 19/20, Holborn, E.C.1.

Liquidations

The County Electrical Co. (Pendleton), Ltd.—Winding up voluntarily. Liquidator, Mr. H. T. Blood, 8, Chatham Street, Manchester. A declaration of solvency has been filed with the Registrar of Companies. Particulars of claims to the liquidator by 23rd June.

Durrington Electric Light Co., Ltd.—Particulars of claims by 3rd June to the liquidator, Mr. P. A. Grant, 31, Castle Street, Salisbury, Wilts.

Southern Electrical Accessories, Ltd.—Winding up voluntarily. Liquidator, Mr. W. H. Green, 21, Cumberland Place, Southampton.

Bankruptcies

C. A. Norwood, lately residing and carrying on business at 38, Thornbury Road, London, S.W.2, as an electrical contractor.—Receiving order made 13th May on debtor's own petition.

J. F. Draper, electrician, lately carrying on business at 230, Horn Lane, Acton, London, W.3.—First meeting held 26th May at 20, Eaton Place, London, S.W.1. Public examination 1st July at the Court House, Half Acre, Brentford.

W. S. Forrest, carrying on business at 45, Carholme Road, Lincoln, electrical engineer.—Receiving Order made 18th May on debtor's own petition.

STOCKS and SHARES

BUSINESS in most of the Stock Exchange markets remains on what members call the quiet side. Spasmodic and sporadic changes occur in correspondence with unexpected pleasure, or disappointment, over dividend announcements; but, apart from these, the tenor of markets remains subdued and prices are dull.

Company News

Rheostatic produced a notably good profits statement, which, however, had little effect on the 4s shares. They stood at 11s 6d cum the final dividend, and pay over 6¾ per cent on the total distribution of 20 per cent. Veritys' 5s shares are quoted at 4s 3d and give 5¾ per cent on the dividend repeated at 5 per cent. The Southern Areas Electric dividend of 5½ per cent is the same rate as was being paid before the take-over of the electricity supply investments. Subsequent development of the manufacturing interests has resulted in an increase in the net profit. The £1 shares have hardened to 19s giving a yield of £5 18s per cent. Southern Areas is practically the sole home company surviving in the electric supply section of the Stock Exchange Official List.

Fine Figures

Outstanding among last week's company results were the preliminary profits statements of Siemens Bros. and Allen West. The latter's consolidated net profit for 1948 comes out at more than double the previous year's, and puts the 10 per cent distribution among the most conservative of payments: earnings on the £609,000 capital—all in ordinary stock—appear to be over 70 per cent. At 11s 6d ex dividend the yield on the 5s shares is £4 7s per cent. Siemens Bros. report provisionally a rise of about 20 per cent in the net profits of the parent company: for the group figures, the full accounts will have to be awaited. As with Allen West, the extra revenue goes back into the business, and shareholders receive the 7½ per cent payment which dates back without a break to 1936. The shares at 35s 6d pay nearly 4¼ per cent on the money.

Results to Come

Results already published this year by several of the leading cable manufacturers mean that much is expected of those still to come. British Insulated Callenders end their year in December and declared their final dividend last time in June. On that occasion the accounts showed an increase in trading profits of roughly a million pounds over those of the preceding eighteen months, although taxation took the lion's share of it. Today's price of 32s is a florin down on the week. Hackbridge Cables' financial year ended in March, and that of Scottish Cables in April. Both will be publishing in due course their first results as public companies. Yields on these shares vary from slightly over 4 per cent on B.I.C. at 32s to a prospective 4¾ per cent on Scottish Cables at 25s 3d, and over 6 per cent on Hackbridge Cables at 16s 3d.

E.M.I. Preference Shares

Electric & Musical Industries new 4½ per cent preference shares are available in substantial lines at 22s 6d, yielding 4 per cent. They have been issued in connection with the redemption of the company's 6½ per cent preference capital, and are themselves redeemable at 22s 6d in or after 1959. Until the middle of next month, a buyer can acquire the shares free of transfer stamp, and thus save himself nearly 6d a share in expenses. Other preference shares on offer include Laurence Scott 4½ per cents at 22s 3d, yielding £3 16s 6d per cent, and Thorn Electric "fives" at 21s 1½d, which give £4 14s 9d per cent. The 5½ per cent issues of E. K. Cole and Plessey are available at 23s and 26s respectively, the returns being approximately 4¾ and 4¼ per cent.

B.E.T.

Remarkable fluctuations have occurred in the price during the past week of British Electric Traction deferred stock. Upon lively anticipation of an issue on bonus terms, the price rose 65 points, to 1920. Sales brought back the price to 1830, leaving it 25 points down on the week. The selling came as something of a surprise, and it was thought that possibly cautious dividend estimates, as well as profit-taking, might have caused the realizations. It is understood that the accounts will probably be delayed for a few weeks, and that the dividend declaration may not be forthcoming until the middle of June.

Price Changes on the Week

Cable & Wireless ordinary at 240 is 4 points higher, the preference remaining at 116½. Vactrics have again become volatile, a rise to 21s 3d being followed by reaction to 20s. Falk Stadelmann at 46s 3d are 1/16 higher. Baldwins at 7s 3d are 6d up; English Electric advanced to 47s. Hall Telephone Accessories responded further to the doubled profits with a rise to 16s 3d. On the other hand Johnson & Phillips, after their recent jump, reacted to £4. Tube Investments from 6½ gave way to 6¼. Telephone Properties at 11s 3d show a fall of 2s 6d. Lucas shares eased off to 83s 9d, De la Rue to 33s 9d, British Vacuum Cleaner to 10s 6d. Calcutta Electrics and Calcutta Trams are 1s lower at 25s and 23s 6d respectively.

Power Station Efficiencies

PROGRESS SINCE VESTING DAY

IMPROVED operating technique, a greater uniformity in the qualities of coal delivered to power stations, the commissioning of new higher efficiency plant and the availability of more expert advice to the smaller stations has resulted in a steady rise in the efficiency of steam generating stations of the British Electricity Authority during the first year of nationalized operation.

The comparative thermal efficiency figures relating to kWh sent out are 20.86 per cent for the twelve months ending 31st March, 1948, and 21.07 per cent (a preliminary figure) for the succeeding twelve months. Comparing the calendar years 1947 and 1948, the percentages were 20.70 and 21.03 respectively.

A comparison between kWh sent out and coal consumption of all steam generating stations in Britain, including the North of Scotland Hydro Electric Board, for the years ending 2nd April, 1948, and 22nd April, 1949, shows a rise of 10.8 per cent sent out against an increased coal consumption of 8.3 per cent. This represents an improvement in coal consumption per kWh sent out of approximately 2.3 per cent, or a saving of some 650,000 tons of coal.

Overall fuel costs per kWh sent out have fallen in each quarter since vesting day. For the three months ending June, 1948, the figure was 0.4291d; for the next three months ending September, 1948, it was 0.4246d; for the three months ending December, 1948, 0.4162d and for the three months ending March, 1949, there is a preliminary figure of 0.4107d.

There has also been a considerable reduction in the average loss of output capacity due to unsuitable fuel. This is attributed to the more consistent quality of coal deliveries and closer contact between divisional controller organization and the Regional Board of the National Coal Board, enabling fuel within a Generation Division to be allocated to the power station best suited to use it. At the time of maximum demand on 1st April, 1948, there was a loss of capacity of 286,000 kW sent out because of bad fuel; at 31st March, 1949 the loss was 241,000 kW, a reduction of approximately 16 per cent.

More expert advice for the smaller stations, improved operating technique and the more rapid completion of maintenance overhaul and repairs are reflected in the improvement in availability of generating plant. In March, 1948, breakdowns accounted for an 8 per cent loss of available generating capacity, but for the same month this year the figure was only 4.9 per cent. The general effect of this reduction in loss of capacity due to breakdowns and unsuitable fuel will enable the overhauling of machinery, which must be carried out each year, to be effected much more easily. Thus the risk of load shedding should be alleviated somewhat during cold snaps in the summer months, when a greater proportion of plant is out of commission for inspection and repair.

Street Lighting Plans

IN November last Reading Finance Committee decided to apply for consent to borrow £16,125 to convert 637 gas street lamps to electric lighting. The Ministry of Transport having intimated that it is not prepared to approve the proposal, the Highways Committee has now recommended the Council to convert 100 lamps only at the present time at an estimated cost of £2,500.

The Chief Constable of Birkenhead has recommended that under the street electric lighting programme the following works should be carried out as soon as possible:—New Chester Road, conversion to sodium lighting using existing columns, estimated cost £4,000; Woodchurch Road and Thingwall Road, 58 columns, conversion of high-suspension gas lamps, estimated cost £4,446; Mount Road and the Wiend, 24 columns, estimated cost £1,483.

Restricted street lighting is to continue at Tiverton, once described as "the best-lit town in the West." The South Western Electricity Board had informed the Highways and Lighting Committee of the additional cost of bringing the whole of Class "A" lighting into operation and the proposal for improved lighting made after complaints from motorists was rejected on grounds of expense.

Radcliffe Lighting Committee proposes to improve the lighting in Bolton Road and Water Street by the erection of forty-two 140 W discharge lamps. The estimated cost is £1,900.

New 30ft standards are being erected to carry 400 W mercury discharge lamps for lighting Yeovil's trunk roads. Altogether 110 lighting points are scheduled.

Fluorescent lighting is proposed in an improved street lighting scheme for Guiseley, Yeadon and Rawdon.

Electricity Supply

Load Shedding in North : Perthshire Hydro-Electric Projects

POWER cuts were made over a wide area of North England on 17th May following faults on transmission lines. A statement by the British Electricity Authority explained that the trouble began about 10.40 a.m. when the line between Galashiels and Dunston (Newcastle) tripped out. Lightning was believed to have been the cause though this had not yet been established. A second main line in the grid between Padiham and Nelson tripped out at 11.40. During the period of the trouble, load-shedding up to an hour and a half took place in the Leeds, Manchester, Newcastle, and Birmingham areas, and for about half an hour in East Anglia. The cuts were up to 15 per cent in Leeds and Manchester and 10 per cent in the other areas.

Charges in Scotland

With a view to securing united action on the subject of electricity charges, Sir Andrew Murray, Lord Provost of Edinburgh, has arranged a meeting with the Counties of Cities Association. Presiding at a meeting of Edinburgh Town Council on 19th May he said that the new installation at Portobello was being provided at something like half of what the costs were in other parts of the country, and when the bulk supply tariff was originally framed a deduction of 4 per cent was made for the S.E. Scotland Area. This had already been decreased to 2 per cent, and it seemed logical that the next step would be to do away with it altogether and so achieve the apparent aim of obtaining a national tariff. Speaking of the winter surcharge, which was not paid by consumers in the North of Scotland Area, the Lord Provost said the idea that S.E. and S.W. Scotland should be treated as an appendage of England did not seem reasonable. There were consumers in and around Galloway receiving electricity generated by water power who had to pay the winter surcharge, while other people, lucky enough to be staying north of the Forth, got away with no surcharge at all.

Welsh Rural Supplies

At a meeting of the South Wales Electricity Consultative Council on 18th May, at Cardiff, it was decided not to press the Electricity Board for an interim scheme for the supply of electricity to farms. In a letter the Board stated it was carrying out detailed surveys in connection with the development programme. In one area a publicity campaign would be necessary because it had been found that a high proportion of farmers were not convinced of the advantages of taking electricity. The chairman of the Council (Ald. A. E. Gough) thought the best publicity campaign would be for the Board to prepare and present a scheme to farmers. Another member said that in Barry there had been a considerable rush for supplies.

Generation Statistics

The monthly statement issued by the Ministry of Fuel and Power shows that 3,775 million kWh was generated in April. This was only 0.8 per cent more than in the corresponding month last year but Easter then fell in March. In the first four months of this year 17,433 million kWh was generated, 5.8 per cent more than in January-April, 1948. Installed capacity at the end of last month aggregated 13,277 MW against 12,929 MW a year ago; the 348 MW addition which this represents is actually a conservative figure since plant disconnected

	Fuel consumed Thousand tons		kWh generated Millions			kWh sent out Millions	Installed capacity (m.c.r.) MW
	Coal	Oil	Steam	Water Power	Total*		
British Electricity Authority ...	2,210	3.0	3,631	41	3,684	3,477	12,955
North of Scotland	12	0.8	17	71	91	90	322
Total for March, 1949	2,222	3.8	3,648	112	3,775	3,561	13,277
Total for March, 1948	2,228	4.1	3,624	108	3,744	3,532	12,929
Per cent increase or decrease ...	− 0.3	− 7.3	+ 0.7	+ 3.7	+ 0.8	+ 0.8	+ 2.7
Total January—April	10,257	18.0	16,875	489	17,433	16,465	
Corresponding period of 1948 ...	9,951	14.9	15,943	483	16,483	15,568	
Per cent increase	+ 3.1	+ 20.8	+ 5.8	+ 1.2	+ 5.8	+ 5.8	

* Including generation by other means amounting to 15.0 million kWh in April

and written off but not removed from the stations is now excluded. Details of fuel consumed and an analysis of electricity generated by steam and water power, etc., are given in the table on page 929.

In the week ended 13th May 801.3 million kWh was sent out for public supply from solid-fuel-fired stations, compared with 831.7 million in the previous week and 730.6 million in the week ended 14th May, 1948.

Midlands Consultative Council

The setting up of district committees of the Midlands Electricity Consultative Council to coincide with the seven Sub-Areas of the Board was announced by the chairman of the Council (Alderman H. Leason), in Wolverhampton last week. He said that Alderman the Rev. T. Horwood would be chairman of the North Staffordshire District Committee.

Regarding the hire of domestic electrical apparatus, a question which had been raised by Solihull U.D.C., the chairman expressed the view that the matter should be considered on a national basis. As a Council they thought that hiring should still be considered.

A complaint regarding charges was received from the Leek Manufacturers' Association which felt that some concession should be made to manufacturers in view of the fact that, at the request of the authorities, they had curtailed their demands. The chairman said that the Board had promised to look into this question.

Water Power in Perthshire

Perthshire is the area chosen for the latest Constructional Schemes of the North of Scotland Hydro-Electric Board. Two separate projects, one in the Ben Lawers range of hills in Perthshire and the other between Kinloch Rannoch and Rannoch Station have been confirmed by the Secretary of State for Scotland and laid before Parliament.

The enlargement of Lochan-na-Lairige and its use as a storage reservoir by the building of a dam 130ft high near the present outlet of the loch is the main feature of the Lawers scheme. This project covers a catchment area of 17½ square miles. A series of aqueducts on the Ben Lawers range will divert into the loch the head waters of streams running from the south-eastern slopes of Ben Lawers into Loch Tay and from the north-western slopes into Glen Lyon. These aqueducts will be constructed at heights over 1,700 ft above sea level, but the larger parts of the catchment areas of the streams utilized lie below that level and remain unaffected by the scheme. The impounded water, which will have a usable fall between Lochan-na-Lairige and Loch Tay of 1,362ft, will be conducted by pipeline and pressure tunnel to a generating station with an installed capacity of 30,000 kW, to be built near Finlarig at the western end of Loch Tay. The scheme will meet the rapidly growing needs of the Board's area and will supplement supplies of power for the Central Scottish grid. The output will be 71,000,000 kWh in an average year and the estimated cost of the scheme is £2,850,000.

The Gaur project is planned as a simple and economic scheme to feed the transmission lines to Oban, Kinlochleven, Ballachulish and Taynuilt. From Loch Eigheach, which will be enlarged, a pipe-line will take the water to a generating station with an installed capacity of about 6,000 kW 200yd south of the bridge which carries the road from Rannoch Station to Kinloch Rannoch over the Allt Chaldar Burn. The scheme should produce an annual average output of about 17 million kWh and the estimated cost is £650,000.

Fluorescent Street Lighting

The experimental fluorescent lighting system in Northumberland Street, Newcastle-on-Tyne—the city's main thoroughfare—is to be extended throughout the street. Some months ago the Ministry of Transport refused to sanction a similar proposal on the grounds that the lighting did not conform with the recommendations of the Departmental Committee set up in 1937. Local authorities can now spend up to £1,000 without seeking Ministry approval, and it is believed that this amount would go a long way towards completing the scheme. The Council intends eventually to use fluorescent lighting throughout the main roads of the city, but this work is not likely to be started for some time on account of the expense. At present the city has 21,000 lamps comprising 12,000 gas and 9,000 electric.

Information Department

THE extensive records of our Information Department enable us to reply to most queries, but occasionally we ask for our readers' assistance in tracing names and addresses not known to us. We should be glad to have such information regarding the makers of the following:—

Watertight plugs and sockets bearing the letters S.E.W. and L.E.W. in a circle.

General inquiries from readers relating to sources of electrical goods, makers' addresses, etc., are replied to by the Information Department through the post. Inquiries should be accompanied by a stamped addressed envelope.

NEW PATENTS

Electrical Specifications Recently Published

The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (2s each) may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.

1942

12965. London, H., and Appleton, E. V.—Electrolytic process and apparatus. 14th September, 1942. (622724.)

1943

19588. Sperry Gyroscope Co., Inc.—High-frequency electron-discharge tube structure. 22nd December, 1941. (622634.)

1944

8442. British Thomson-Houston Co., Ltd.—Electric switch contacts. 6th May, 1943. (622814.)

20165. British Thomson-Houston Co., Ltd.—Electric transformers. 18th October, 1943. (622726.)

22766. Sperry Gyroscope Co., Inc.—Radio-receiving apparatus for steering aircraft in a predetermined path. 23rd November, 1943. (622455.)

1945

15779. Newton, E. P. (Telefonaktiebolaget L. M. Ericsson).—Contact arrangements for electric switches. 20th June, 1945. (622638.)

26604. Steinhoff, J. R.—Electronic switching system for use for example in a directional radio receiver. 20th October, 1944. (622458.)

32648. Marconi's Wireless Telegraph Co., Ltd.—Direction finders. 20th May, 1943. (622822.)

35257. Philco Corporation.—Electric signal attenuators. 30th December, 1944. (622823.)

1946

4034. British Thomson-Houston Co. Ltd.—Electric transformers. 17th February, 1945. (622462.)

9378. Soc. Francaise Radio-Electrique.—Electric-discharge devices. 16th July, 1940. (622826.)

9397. Walsall Conduits, Ltd., and Gough, E.—Plug-and-socket connectors for electric circuits. 27th March, 1946. (622467.)

9398. Walsall Conduits, Ltd., and Gough, E.—Terminal contacts or sockets of electrical switches and plug-and-socket couplings. 27th March, 1946. (622468.)

9670. British Thomson-Houston Co., Ltd.—Cooling systems for electrical apparatus. 2nd April, 1945. (622648.)

10780. Kapitza, P. L.—Means for rectification. 8th April, 1946. (622469.)

11413. Ericsson Telephones, Ltd., and Crowe, D. C.—Electro-mechanical means for registering and storing data expressible by combinations of symbols in code form. 13th April, 1946. (622650.)

11697. Marconi instruments, Ltd., Brockelsby, C. F., and Todd, W. A. H.—Electric measuring instruments for measuring the moisture content of materials. 16th April, 1946. (622470.)

13490. Diprose, K. V.—Photo-electric follower apparatus. 3rd May, 1946. (622472.)

14655. Sperry Gyroscope Co., Inc.—High-frequency electron-discharge apparatus. 22nd December, 1941. (Divided out of 622634.) (622655.)

15072. Robson, D. S.—Loudspeakers and like electro-acoustic transducers. 16th May, 1947. (622828.)

16013. Philips Lamps, Ltd.—Circuits for producing a sawtoothed-shaped current in the deflecting coils of a cathode-ray tube. 20th March, 1942. (622656.)

16863. Grimm, A.—Electro-magnetic audible and visible current circuit tester. 4th June, 1946. (622476.)

16992. Loeb, J. M.—Apparatus materializing the paths of electrified particles moving inside a magnetic field. 14th November, 1945. (622477.)

19818. Marconi's Wireless Telegraph Co., Ltd., and Grisdale, G. L.—Automatic frequency control circuit arrangements. 2nd July, 1946. (622479.)

19980. Krebs & Co. Kommanditges.—Device for the protection of the cathodes of electrolytic cells. 16th November, 1945. (622662.)

21865. Airmec Laboratories, Ltd., Solley, B. J., Roberts, P. W.—Electro-acoustic transducer arrangements. 22nd July, 1946. (622830.)

24067. Soc. d'Applications Telephoniques.—Electron-optical device. 11th September, 1944. (622484.)

24479. Triggs, W. W. (Bendix Home Appliances, Inc.).—Water control mechanism for automatic washing machines. 16th August, 1946. (622485.)

25471. Philips Lamps, Ltd.—Electric-discharge tubes. 4th December, 1942. (622667.)

27131. Soc. le Carbone-Lorraine.—Anodes for intensive electric arcs. 28th December, 1943. (622748.)

27556. Imperial Chemical Industries, Ltd. Drummond, A. A., and Jacob, B.—Electrical insulation containing synthetic resin. 13th September, 1946. (622671.)

27637. Rahbek, K.—Device for utilizing the electrostatic attraction produced by the passage of electric current across the surfaces of contact between a semi-conductor and a conductor. 27th February, 1946. (622672.)

28225. Weltronic Co.—Rectifier control systems. 15th December, 1944. (622836.)

28799. British Thomson-Houston Co., Ltd., and Mackenzie, T. H.—Electronic amplifiers. 26th September, 1946. (622491.)

28808. Philips Lamps, Ltd.—Cathode-ray tubes producing directed beams of electrons. 21st April, 1943. (622492.)

29124. Philips Lamps, Ltd.—Tunable apparatus. 25th May, 1943. (622838.)

29509. Westinghouse Electric International Co.—Electrolytic polishing of silver. 20th July, 1945. (622750.)

29979. M. & C. Switchgear, Ltd., and Morrison, R.—Electrical driving control means for conveyors. 8th October, 1946. (622842.)

31239. Philips Lamps, Ltd.—Grid-controlled electric-discharge tubes. 16th February, 1943. (622679.)

31386. Reeves Electrical & Radio Co., Ltd., and Reeves, D. W.—Electric irons. 22nd October, 1947. (622681.)

34345. Walsall Conduits, Ltd., and Gough, E.—Terminals of electrical accessories. 20th November, 1946. (622845.)

34346. Walsall Conduits, Ltd., and Gough, E.—Plug-and-socket connectors for electric circuits. 20th November, 1946. (622846.)

35526. Radio Corporation of America.—Circuits for providing stepped-up d.c. voltage. 29th November, 1945. (622847.)

36695. Scott (Electrical), Ltd., G. R., and Scott, G. P.—Processes and apparatus for treating sewage. 12th December, 1946. (622691.)

37902. Wilcolator Co.—Automatic change-over relay system for supplying current from a spare current source upon the failure of a main current source. 1st February, 1945. (622505.)

38107. Slade, H. G.—Snap-action electric switches. 31st December, 1946. (622693.)

1947

3482. First Industrial Corporation.—Snap-acting electric switches. 6th February, 1946. (622507.)

3637. Westinghouse Electric International Co.—Blading locking arrangements for a bladed rotor. 8th February, 1946. (622701.)

4183. Standard Telephones & Cables, Ltd., and Robinson, G. B.—Soldering. 13th February, 1947. (622703.)

6230. Osborn, H. J., and Osborn, A. D.—Instruments for locating faults in electric cables and/or measuring electrical capacity. 5th March, 1947. (Cognate application 25173/47.) (622710.)

6273. Waterhouse, H., and Willows, R.—Electric accumulators. 5th March, 1947. (622512.)

6343. Philips Lamps, Ltd.—Circuits for the modulation of electrical oscillations. 29th March, 1944. (622711.)

7302. Standard Telephones & Cables, Ltd., and Gilliver, G.—Electric welding. 17th March, 1947. (622515.)

7328. British Thomson-Houston Co., Ltd.—Methods of preparing hydrocarbon-substituted halogenosilanes. 18th March, 1946. (622516.)

7613. Mond Nickel Co., Ltd.—Electrodeposition of nickel and electrolytic cells. 12th April, 1946. (622531.)

7691. Soc. Tecnica Applicazioni Metalli Duri ed Affini S.T.A.M.A.—Machines for manufacturing metal wire coils particularly coiled filaments for electric incandescent lamps, electron tubes and similar devices. 18th May, 1946. (622712.)

7847. British Thomson-Houston Co. Ltd.—Electric induction apparatus. 21st March, 1946. (622538.)

7983. Redfern, G. J.—Electrically heated bandage. 24th March, 1947. (622548.)

8220. Milne & Longbottom, Ltd., Butterworth, E. M., and Avery, E.—Alternating-current magnets. 26th March, 1947. (622557.)

8350. British Thomson-Houston Co., Ltd.—Glass tube bending apparatus. 30th March, 1946. (622563.)

8376. Faulkner, A. W.—Electrical plug-and-socket connectors. 27th March, 1947. (622565.)

8466.—Pyrotenax, Ltd., and Clothier, G. D.—Connecting devices or glands. 28th March, 1947. (622571.)

8491. British Thomson-Houston Co., Ltd.—Control systems for electric motors. 28th March, 1946. (622573.)

8493. British Thomson-Houston Co., Ltd.—Glass tube bending apparatus. 30th March, 1946. (622574.)

8526. Hughes, C. L. (Blair, G., and Comings, H. E.). —Thermostatic plug connector for electrical appliances. 28th March, 1947. (622580.)

8536. Courtin, M.—Electric lampholders. 28th March, 1946. (622581.)

8562. Evans, S. C.—Electromagnetically operated switches for use in motor-vehicle headlight dipping and/or deflecting mechanism. 29th March, 1947. (622582.)

8579. Automatic Telephone & Electric Co., Ltd., Woodland, C. R., and Houghton, E. I.—Galvanometer-type relays. 29th March, 1947. (622585.)

8633. Philips Lamps, Ltd.—Push-pull mixing circuits. 26th July, 1944. (622763.)

8701. Barrie, D. G. E.—Junction boxes for lead-covered cables. 31st March, 1947. (622596.)

8748. Brooke, W., and Baldwin, H. T.—Operation of fluorescent lamps from low voltage d.c. circuits. 1st April, 1947. (622600.)

8796. Westinghouse Electric International Co.—Electrical distribution systems and protection thereof. 20th February, 1946. (622605.)

8819. Forges et Ateliers de Constructions Electriques de Jeumont.—Electric locomotives. 1st August, 1946. (622609.)

8824. British Thomson-Houston Co., Ltd., and Warren, F. W.—Guards for machine tool. 1st April, 1947. (622612.)

8825. British Thomson-Houston Co., Ltd.—Thermal-responsive systems. 4th April, 1944. (622613.)

8869. Bender, C. C.—Electric plug connectors. 1st April, 1947. (622621.)

8978. Kemp, K. W. L.—Electromagnetic relays. 2nd April, 1947. (622629.)

8990. General Electric Co., Ltd., and Smith, K. C.—Electric plug-and-socket couplings. 2nd April, 1947. (622631.)

8991. British Thomson-Houston Co., Ltd., and Huitson, R. R.—Detachable magnetic pipe connections. 2nd April, 1947. (622632.)

8992. British Thomson-Houston Co., Ltd.—Flat irons. 4th April, 1946. (622633.)

9049. Revo Electric Co., Ltd., Felton, A. E., and Felton, F. D.—Pressing irons. 3rd April, 1947. (622765.)

9147. Static Condenser Co., Ltd., and Tibbs. C. E. M.—Radio frequency heating apparatus. 3rd April, 1947. (622774.)

9208. Pye, Ltd., and Dalgleish, J. W.—Permeability tuning devices incorporating iron dust cores. 3rd April, 1947. (622854.)

9237. Taylor, E. H.—Snap-action electric switches. 5th April, 1947. (622781.)

9285. General Electric Co., Ltd., Collyer, J. E., and Rose, W. R.—Electromagnetic relays. 8th April, 1947. (622783.)

9411. Standard Telephones & Cables, Ltd.—Carrier current transmission systems. 20th June, 1942. (622787.)

9413. Standard Telephones & Cables, Ltd., Lee, E. C., and Gosden, J. H.—Terminating devices for high-frequency plastic insulated coaxial cables. 9th April, 1947. (622867.)

9441. British Thomson-Houston Co., Ltd., Milner, C. J., and Rushall, R. T.—Connection of terminal leads to semi-conducting resistors. 9th April, 1947. (622789.)

9470. Metropolitan-Vickers Electrical Co., Ltd., and Baumann, K.—Internal-combustion and other high-speed high-temperature turbines. 9th April, 1947. (Addition to 585086.) (622869.)

9565. Si, L. Y.—Electric torches. 5th July, 1939. (622796.)

9583. General Electric Co., Ltd., Freeman, A. A. H., and Coleman, A. S.—Electric lighting fittings. 10th April, 1947. (622878.)

9589. Metropolitan-Vickers Electrical Co., Ltd., and Mandl, A.—Fluorescent electric lighting systems. 10th April, 1947. (622799.)

9729. Dubilier Condenser Co. (1925), Ltd. (Dubilier, W.).—Terminal sealing arrangements for electrical condensers or other electrical devices enclosed in containers. 11th April, 1947. (622882.)

9902. Metropolitan-Vickers Electrical Co., Ltd., and Haynes, F. G.—Apparatus for thermal treatment of small articles. 14th April, 1947. (622886.)

9951. Automatic Telephone & Electric Co., Ltd., and Ellis, J. H.—Magneto generators. 15th April, 1947. (622811.)

9954. Scrivener, Ltd., A., and Scrivener, A.—Surface finishing or polishing apparatus. 15th April, 1947. (Cognate application 2502/48.) (622887.)

9990. General Electric Co., Ltd., and Donelan, J. A. —Electric cables. 15th April, 1947. (622888.)

10067. Rotax, Ltd., and Hughes, C. K.—Dynamo-electric machines. 16th April, 1947. (622891.)

10236. British Thomson-Houston Co., Ltd.—Snap-action devices. 17th April, 1946. (622901.)

Factory Fire Action

IN the King's Bench Division of the High Court last week Mr. Justice Jones concluded the hearing of an action by the Philco Radio and Television Corporation of Great Britain, Ltd., against J. Spurling, Ltd., to recover damages for alleged negligence, which defendants denied.

His Lordship, in giving judgment, said that in 1944 part of the plaintiffs' factory at Perivale suffered from fire damage which plaintiffs alleged to be due to the action of defendants in delivering by mistake at plaintiffs' premises five crates containing film scrap, a highly inflammable material. Plaintiffs' foreman recognized that it was dangerous and gave instructions for the contents of one case which had been opened to be put back. Just about then a typist passed by and one witness had noticed that she had a cigarette. Immediately afterwards there was an explosion. Defendants denied that they knew the contents of the cases and pleaded that the fire was due to the cigarette. His Lordship found that there was no negligence on the part of plaintiffs and therefore defendants were liable, and he entered judgment for plaintiffs for an amount to be ascertained by the Official Referee with costs.

CONTRACT INFORMATION

ACCEPTED TENDERS AND PROSPECTIVE ELECTRICAL WORK

Contracts Open

Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses.

Belfast.—16th June. City Council. Interior lighting schemes for the City Hall dome. Estates Department, Room 70, City Hall.

Caernarvon.—10th June. Corporation. Wiring of fifty-six houses on Maes Barcer estate. (20th May.)

Edinburgh.—North of Scotland Hydro-Electric Board. Electrical installations at Storr Lochs power station. (20th May.)

Cheadle & Gatley.—4th June. U.D.C. Lamps for street lighting, lighting standards and fittings for the year ending 31st March, 1950. (20th May.)

Felling.—6th June. U.D.C. Electric wiring, fittings, equipment, materials and components, for fifty houses in course of erection at High Lanes, Heworth. Housing architect, Council Buildings.

India.—MADRAS.—1st September. Government Electricity Department. 132 kV transmission lines. (C.R.E. (I.B.) 13259/49. Ten/384.)*

LUCKNOW.—The closing date for receipt of tenders for plant for the Pathri hydro-electric power station has been extended to 1st August. (C.R.E. 8329/49. Ten/379A.)*

Leeds.—12th July. Transport Committee. Two 600 kW mercury arc rectifiers. (20th May.)

Lanark.—County Council. Street lighting fittings for 140 W sodium lamps. (See this issue.)

Newcastle-on-Tyne.—Education Committee. Additions to electrical installation at South Benwell Primary School. City architect (Education Section), 31, Northumberland Road.

Northumberland.—County Council. Installation of electricity in two sectional steel huts at Wallsend Grammar School. County architect, County Hall, Newcastle-on-Tyne.

Southend-on-Sea.—14th June. Education Committee. Electrical installation at Municipal College, Victoria Circus. (See this issue.)

Sunderland.—Corporation. Electrical installations in eight shops and houses on Thorney Close estate. Borough engineer, 27, Fawcett Street.

West Hartlepool.—Corporation. Supply of 155 electric cookers and 155 wash boilers. Borough architect, Municipal Buildings.

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* Specifications may be inspected at the Commercial Relations and Exports Department, Thames House North, Millbank, S.W.1.

Orders Placed

Bath.—Corporation. Recommended. Electrical installation at Moorlands Junior School (£1,662).—Central Electric, Bath.

Hayes (Middx.).—Electrical installations in eighty-six houses at Bourne Farm Estate.—Alpha Manufacturing & Electrical Co.

London.—L.C.C. Electrical installations in schools. Joseph Lancaster School, Walworth.—Honor Bros. Downham Central School and Largefield Road School.—William Steward & Co. Slade School, Plumstead.—London Electricity Board, Woolwich.

Contracts in Prospect

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Barrow-in-Furness.—Houses (123), Newbarns (South) site; borough engineer.

Dagenham.—Four blocks of three-storey flats, Eastbrook estate, and houses (26), Blackborne estate; borough engineer.

Dartford.—Houses and bungalows (54), Saddlers Hall, Eynsford; E. James, clerk to R.D.C., West Hill.

Didcot.—Houses (30) for Ministry of Works; Y. J. Lovell & Son, Ltd., builders, Marsham Lane, Gerrards Cross.

Doncaster.—Houses (164), with shops, near Weston Road, Balby; H. S. Essenhigh, town clerk, 1, Priory Place.

Durham.—Development scheme at Dryburn Hospital for the Newcastle Hospital Board; P. H. Knighton, planning architect, "Dunira," Osborne Road, Newcastle-on-Tyne.

Eastbourne.—Offices, Grove Hall, for Borough Engineer's Department; R. Williams, borough engineer, 2-4, Saffrons Road.

East Suffolk.—Schools, Beccles and Mellis; E. J. Symcox, county architect, Ipswich.

Eston.—Houses (42), Jubilee Road estate, for the U.D.C.; Hudson Brothers, Ltd., builders, Fidler Street, Middlesbrough.

Evesham.—Houses (44), Fairfield and The Elms; H. Parkes, borough surveyor, Municipal Offices.

Fareham.—Houses (106), Fareham Park; H. A. Watts, clerk to U.D.C., 5, Grove Road.

Felling (Co. Durham).—Factory for Stoneygate Flooring Co., Ltd.; E. M. Lawson, architect, Barras Buildings, Barras Bridge, Newcastle-on-Tyne.

Houses (392), near Wardley Hall, for U.D.C.; D. W. Green, housing architect.

Gainsborough.—Houses (260), White's Wood Lane site; U.D.C. surveyor.

Gateshead.—Alterations to homes for Corporation Welfare Committee (£60,000); chief architect, Municipal Buildings.

Glasgow.—R.C. primary school, Toryglen; R. J. Walker & Smith, architects, 108, Douglas Street.

Gloucester.—Houses (100), Easiform type, Elmbridge Farm estate; John Laing & Son, Ltd., builders, Mill Hill, N.W.7.

Goring-by-Sea.—Joinery works, etc., Goring Street Gorham (Contractors), Ltd., 4, The Crescent, Goring Road.

Gosforth.—Offices near Moor Road for Thomas Hedley & Co., Ltd., soap manufacturers, City Road, Newcastle-on-Tyne; staff architect.

Houses (18) for the U.D.C.; M. J. Liddell & Son, builders, Hunters Road.

Guisborough.—Houses (44), Grosvenor Place area; U.D.C. surveyor.

Haltwhistle.—Houses (44), Redburn, near Bardon Mill; R.D.C. surveyor.

Hebburn-on-Tyne.—Houses (700), near Mill Lane, for the U.D.C.; Page, Son & Hill, architects, 75, King Street, South Shields.

Ilkeston.—Block of shops and maisonettes at Cotmanhay estate; borough engineer.

Ilford.—Primary school, Strafford Avenue; K. F. B. Nicholls, town clerk, Town Hall.

Keighley.—Factory, Hard Ings Road, for Amalgamated Playing Card Co., Ltd.; secretary.

Kessock.—Infants' school (£44,500) for Inverness-shire E.C.; county architect, County Buildings, Inverness.

Kirkcudbright.—County offices (£30,000); county architect, County Offices.

Leeds.—Extensions to Pool Paper Mills for B. S. and W. Whiteley, Pool, near Leeds; secretary.

Lewes.—Garage and bus station, East Street; Southdown Motor Services, Ltd., 5, Steine Street, Brighton.

Lincoln.—Houses (46), Boultham Moor estate; city housing architect, Stamp End.

Liscard.—Primary school for Rev. J. McNally, P.P. St. Alban's, Mill Lane; E. Kirby & Son, architects, 5, Cook Street, Liverpool, 2.

London.—HAMPSTEAD.—Flats (180), Boundary Road, for L.C.C.; Anderson, Forster & Wilcox, architects, 9, Stone Buildings, Lincoln's Inn, W.C.2.

SOUTHWARK.—Block of offices, 133/150, Blackfriars Road, and 40/49, Milcote Street; P. Berg & Co., Ltd., 40/41, Conduit Street, W.1.

Middlesbrough.—New junior section of Thorntree County Primary School; Allen & Hill, quantity surveyors, Tankerville Terrace, Newcastle-on-Tyne.

Morpeth.—Ward additions to Morpeth Cottage Hospital for Newcastle Hospital Board; P. H. Knighton, Board's planning architect, Osborne Road, Newcastle.

Newcastle (Staffs).—Houses (85), Clayton; C. B. Parkes, architect, Bourneville Estate Office, Birmingham.

Reconstruction and extension of warehouse premises; F. & E. Butterworth, Ltd., Brunswick Street.

Oldham.—College for further education, Rochdale Road; A. L. Hobson, borough surveyor, Municipal Buildings, 75, Union Street.

Ormskirk.—Civic centre, Derby Street; surveyor, Urban Council Offices.

Pitlochry.—Employment exchange; A. B. Kennedy & Son, builders, Main Street.

Plymouth. — Cinema (£250,000); Odeon Theatres, Ltd., 5, Bainbridge Street, London, W.C.1.

Restoration of Hyde Park School; Louis de Soissons & Partners, architects, 11, The Crescent.

St. Albans.—Houses (50), Sheephouse Farm, London Colney; E. N. Wheeler, clerk to R.D.C., 43, Upper Lattimore Road.

Scarborough.—Rebuilding Queen's Hotel, North Marine Road, for Catlins (North Wales), Ltd.

Seaton Valley.—Houses (38) at Seghill; U.D.C. surveyor.

Southampton.—Houses (224), Millbrook and Harefield estates; borough architect.

Stanley (Co. Durham).—Houses (50), South Stanley, for the U.D.C.; Tarslag, Ltd., builders, Stockton-on-Tees.

Stockport.—School, Banks Lane; Cruickshank & Seward, architects, 16, Princes Street, Manchester, 2.

Sunderland.—Houses for the T.C. Builders: T. Stewart, Thorney Close, Sunderland (30); S. Bell, Ltd., Sunderland (16); T. D. Gibbons & Son, Hendon Burn Avenue, Sunderland (24); and Sowell & Rawling, Railway Sidings, Sunderland (12).

Surbiton.—Flats (36), South Bank; Couch & Coupland, architects, Lion House, Red Lion Street, Richmond, Surrey.

Shops and flats, Mansfield Road and Bridge Road, Hook; C. H. Coates, Ltd., contractors, Davis Road.

Surrey.—School, Mansfield Road, Hook; county architect, County Hall, Kingston-on-Thames.

Tonbridge.—Flats (24), Brook Street site, for U.D.C.; engineer and surveyor.

Trowbridge.—Houses (36), Studley Green site, for U.D.C.; Pictor, Snailum & Huggins, architects, Abbey Chambers, Bath.

Tynemouth. — New Collingwood county primary school; G. H. Gray, architect, 52, Camden Street, North Shields.

Wakefield.—Houses (130), Spooner type, at Eastmoore; city surveyor.

Wallasey.—Extensions to works; Gandy, Ltd., Wheatlands Works, Seacombe.

Warwickshire.—Secondary school, Bedworth (£260,000); county architect, Shire Hall, Warwick.

Westgate-on-Sea.—Block of flats, Street Court; J. Clems & Son, 234, Blythe Road, Hammersmith, London, W.14. (Amendment of note published in 6th May issue in which the Plymouth office address of J. Clems & Son was given by mistake.)

West Ham.—Flats (40), Keir Hardie estate; borough architect and planning officer, 75, West Ham Lane.

Next Week's Events

Monday, 30th May, to Friday, 3rd June

SCOTLAND.—Institution of Electrical Engineers. Summer meeting. Itinerary includes Edinburgh, Pitlochry and Glasgow.

Monday, 30th May

BIRMINGHAM.—Birmingham Electric Club. Golf competition at Edgbaston Golf Club.

Tuesday, 31st May

LONDON.—At the Royal Society of Tropical Medicine and Hygiene, Portland Place, W.1., 6.30 for 7 p.m. Society of Instrument Technology. Annual general meeting followed by paper on "Some Modern Aspects of Hygrometry," by Prof. H. S. Gregory and E. Rourke.

Wednesday, 1st June

BIRMINGHAM.—Chamber of Commerce, New Street, 7 p.m. Television Society (Midlands Centre). "The V.H.F. Link," by A. H. Mumford.

Saturday, 4th June

CAMBRIDGE.—I.E.E. Cambridge Radio Group. Summer visit.